July 26, 2001 Loureiro Engineering Associates, Inc.

RDMS DocID 00100155

State of Connecticut
Department of Environmental Protection
Bureau of Water Management
Permitting, Enforcement & Remediation Division
79 Elm Street
Hartford, CT 06106

Pratt & Whitney
CTD990673081
R-9
RDMS# 100155

Attn.: Mr. Richard C. Hathaway, Jr.

RE: Remedial Action Work Plan, Revised July 2001
Request for Variance, Engineered Control of Polluted Soils, Revised July 2001
Willow Brook and Willow Brook Pond
Response to DEP Comments

Dear Mr. Hathaway:

We have prepared this letter on behalf of our client, United Technologies Corporation, Pratt & Whitney Division (UTC/P&W), to provide responses to the recent comments raised by the Permitting, Enforcement & Remediation Division of the Bureau of Water Management in regards to the above-referenced documents. This letter is formatted to provide each of the comments followed by the response to the comment in italics. Attached to this letter are the revised sections of the Remedial Action Work Plan and Request for Variance, Engineered Control of Polluted Soils, which address each of the comments we have received. The attachments are as follows:

Attachment No. 1- Remedial Action Work Plan, revised sections 1 through 4

Attachment No. 2 – Dust Control Plan, revised

Attachment No. 3 - Post Remediation Maintenance and Monitoring Program, revised

Attachment No. 4 – Revised pages of the Remedial Action Work Plan, Dust control Plan and Post Remediation Maintenance and Monitoring Program with revisions highlighted.

Attachment No. 4 has been provided in an effort to eliminate the need to read through the entirety of each document to identify the revisions made.

Comments on "Remedial Action Work Plan":

The sections describing the remedial action levels for PCBs in accessible and inaccessible locations do not appear consistent with the applicable sections of the Remediation Standard Regulation.

The Remedial Action Work Plan (RAWP) has been revised to clarify the applicable criteria and the depths at which these criteria will apply. These text modifications occur in sections 1, 2 and 4 of the original Remedial Action Work Plan. Attachment 1 includes the revised text sections (1 through 4).

A concern was expressed with regard to the proposed real-time dust monitoring in the proximity of the material stockpile/processing locations as well as the active excavation areas.

The Dust Control Plan, Willow Brook/Willow Brook Pond included in Appendix D of the RAWP has been revised to reflect real-time dust monitoring downwind of all material handling activities. Attachment 2 includes the revised Dust Control Plan.

Comments on "Request for Variance, Engineered Control of Polluted Soils":

A concern was expressed with regard to the frequency of the required engineered control inspections and the competency of the responsible individuals as proposed in the Post Remediation Maintenance and Monitoring Program.

The Post Remediation Maintenance and Monitoring Program, Willow Brook/Willow Brook Pond has been revised to reflect semi-annual inspections by individuals maintaining the requisite skills necessary to fully assess the potential deficiencies in the engineered control. Attachment 2 includes the revised Dust Control Plan

We hope that the attached revisions adequately address your comments and meet with your satisfaction. As we have indicated on numerous occasions, UTC is fully committed to the implementation of this project during 2001 construction season. Your concurrence with the approach set forth in the attached RAWP and Request for Variance, Engineered Control of Polluted Soils is an essential element to the recognition of this goal. Should you have any further questions or comments, please do not hesitate to contact Lauren Levine of UTC at (860) 728-6520 or me.

Sincerely

LOUREIRO ENGINEERING ASSOCIATES, INC.

Brian A. Cutler, P.E.
Vice President

Attachment

cc: Lauren Levine, UTC
Juan Perez, U.S. EPA
Kim Tisa, U.S. EPA, w/o attachments
Ernest Waterman, U.S. EPA, w/o attachments
Elsie Patton, DEP, w/o attachments
Janet Kwiatkowski, DEP, w/o attachments
Melissa Toni, DEP, w/o attachments
Cori Rose, ACOE, w/o attachments

Attachment No. 1

Remedial Action Work Plan,

Revised sections 1 through 4

REMEDIAL ACTION WORK PLAN

United Technologies Corporation
Pratt & Whitney
Willow Brook and Willow Brook Pond
East Hartford, CT

November 2000
Revised May 2001
Revised July 2001

Prepared for

UNITED TECHNOLOGIES CORPORATION
PRATT & WHITNEY
400 Main Street
East Hartford, CT 06018

Prepared by

LOUREIRO ENGINEERING ASSOCIATES, INC.
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LEA Comm. No 88UT002

Attachment No. 3

Post Remediation Maintenance and Monitoring Program

REMEDIAL ACTION WORK PLAN
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1.0 INTRODUCTION

1.1 General

This Remedial Action Work Plan (RAWP) has been developed to present the approach and strategy for the remediation of Polychlorinated Biphenyl (PCB) contaminated sediment within Willow Brook and Willow Brook Pond at the United Technologies Corporation (UTC), Pratt & Whitney (P&W) manufacturing facility in East Hartford, Connecticut (Site). A Site Location Map is included as Figure 1-1. The remediation approach consists of the excavation and offsite disposal of soil and sediment from within and immediately surrounding Willow Brook and Willow Brook Pond that contains PCBs at concentrations greater than 25 milligram per kilogram (mg/kg or parts per million (ppm)).

Following excavation, a geotextile, soil and rock cap (engineered control) will be installed over the entirety of Willow Brook Pond and the open channel of Willow Brook from Willow Brook Pond to Main Street. The exceptions to this approach is the wetland downgradient of the dam where excavation of soil at concentrations greater than the Residential Direct Exposure Criteria for PCBs will be performed and the area backfilled and planted to restore the wetland, and the footprint of the process water facility where soil will be remediated to meet the Residential Direct Exposure Criteria for PCBs for soils within 4-feet of the final grade, the Commercial/Industrial Direct Exposure Criteria for PCBs for soils located in inaccessible locations and the GB Pollutant Mobility Criteria for soils above the seasonal high water table, prior to the placement of backfill. This particular alternative necessitates a variance to the criteria of the Remediation Standard Regulations (RSRs). In accordance with 22a-133k-2(f)(2)(A) and (B) of the Regulations of Connecticut State Agencies (RCSA), a request to use an engineered control (Request for Variance) was submitted to the Commissioner of the Connecticut Department of Environmental Protection (CTDEP) in January 2001 and was subsequently revised in response to CTDEP comments in May 2001. This report, coupled with the May 2001 revision of the January 2001 Request for Variance, have been prepared to satisfy these requirements. The Request for Variance is incorporated herein by reference.

Following remediation, the open channel of Willow Brook from the pond to Main Street will be restored to the current configuration. In response to a request by the Department of Environmental Protection (DEP) staff, the Willow Brook stream channel will be slightly modified between the dam that impounds Willow Brook Pond and Main Street to reduce the slope of the banks to control potential erosion and to modify the character of the channel bottom to create a low flow channel with pools and eddies. Willow Brook Pond will be restored to the current configuration. The proposed sediment cap will be installed throughout the pond bottoms. Due to the thickness of the cap (3-feet) and based on the proposed sediment removal volume, the final bathymetry within the ponds will be slightly modified to accommodate the proposed cap section.

The limits of the project are defined in two separate areas (upstream of the dam and downstream of the dam) and each area in two separate parts. The limits of the project area upstream of the dam is defined in two parts, Willow Brook Pond and the area of the former oil/water separator. The project area downstream of the dam is defined in two parts, the stream channel of Willow Brook Pond and the wetland area. It is recognized that the potential exists that contamination may exist outside these project limits. However, the intent of this remediation project is to address soil and sediment within and immediately surrounding Willow Brook and Willow Brook Pond. Measures to address contamination beyond those limits described below would be addressed in the future as separate projects.

1.1.1 Upstream of the Dam

Willow Brook Pond: With one exception, the lateral limit of the project area of Willow Brook Pond, inclusive of the small embayment west of the Process Water Facility and the footprint of the process Water Facility, is defined as the horizontal location of the ordinary water level (reference Drawing 1-1). The single exception is the location east of the upper section of Willow Brook Pond in the vicinity of a single soil boring WT-SB-132 (see Appendix A). The project area encompasses this boring to the limits shown on Drawing 1-1. Remediation, if necessary, beyond the limits shown will be performed as a separate project.

Former Oil/Water Separator: The lateral limits of the project area in the vicinity of the former oil/water separator is currently defined as the lateral limit of soils containing PCBs at concentrations greater than 25 ppm. However, it is recognized that the potential exists that PCBs and other constituents may exist in soils outside this lateral limit that would require remediation as part of the project. The current estimate of the lateral limits of the project in this area are depicted on Drawing 1-1.

1.1.2 Downstream of the Dam

Stream Channel Cap: The lateral limit of the project area for the stream channel cap is the 10-year flood elevation (22.0 to 24.0 feet above mean sea level) as shown on Drawing 1-1).

Wetland Area: The lateral limit of the project area for the wetland is currently defined to the south by the northern limit of the stream channel cap and to the north, east and west as the lateral limit of soils containing PCBs at concentrations greater than the Residential Direct Exposure Criteria. The lateral limits of these areas are also depicted on Drawing 1-1.

As discussed subsequently in this section, semi-volatile organic compounds, petroleum hydrocarbons and select metals were also detected in soil and sediment within and immediately surrounding Willow Brook and Willow Brook Pond. These constituents are commingled with soil and sediment containing PCBs. These constituents will remain in place in those areas in which they are commingled with soil and sediment containing less than 25 ppm PCBs and will be rendered inaccessible with the geotextile, soil and stone cap.

In summary, the components of the remediation approach include:

- The excavation and installation of a temporary lined by-pass channel with inlet and outlet structures;
- The demolition of the existing process water facility building structures and the offsite disposal of construction demolition debris;
- The removal and offsite disposal of the former oil/water separator located between upper and lower Willow Brook Pond and the excavation and complete removal of the structure with offsite disposal of impacted soil and concrete and the placement of an engineered control to achieve compliance with the variance provisions in the RSR;
- The excavation and offsite disposal of approximately 8,500 cubic yards of soil and sediment containing total PCBs at concentrations greater than 25 ppm from within and immediately surrounding Willow Brook and Willow Brook Pond;

- The excavation and offsite disposal of approximately 1,500 cubic yards of soil and sediment containing PCBs at concentrations between 1 and 25 ppm from within and immediately surrounding the wetland area located north of Willow Brook;
- The excavation and offsite disposal of approximately 2,500 cubic yards of soil and sediment from within the open channel of Willow Brook to allow for the installation of the geotextile, soil, and stone cap within the stream channel;
- The placement of a geotextile, soil and stone cap (engineered control) over the entirety of the excavated area (with the exception of an approximately 1-acre wetland described below and the footprint of the process water facility) to isolate sediment containing less than 25 ppm total PCBs commingled with semi-volatile organic compounds, petroleum hydrocarbons, and select metals to achieve compliance with the variance provisions in the RSR;
- The restoration of an approximately 1-acre wetland located downstream of the Willow Brook Pond Dam; and
- The implementation of two institutional controls consisting of 1) an Environmental Land Use Restriction to ensure the affected area will not be used for residential purposes and to prohibit excavation; and 2) installation of a fence around the entire area to preclude access to Willow Brook and Willow Brook Pond.

1.2 Background Information

The UTC/P&W facility is located at 400 Main Street in East Hartford, Connecticut, and is approximately 1,100 acres in size. P&W initiated aircraft engine manufacturing operations in East Hartford in December 1929. Current site operations are conducted in a 6.5 million square foot complex and include administration and management, manufacturing, testing, research and development and ancillary services. All of these activities take place in the western portion of the 1,100-acre property. The Rentschler Airport and the Klondike Area occupy the eastern portion of the property. P&W previously used these two areas as an airport and a storage/testing area, respectively.

The Willow Brook and the Willow Brook Pond remediation area is about 4 acres in size as depicted in Drawing 1-1. The site is within a mixed residential, commercial, and industrial area of East Hartford, Connecticut. Property usage in the vicinity of the proposed RA area includes the following:

- UTC/P&W parking facilities and the Rentschler Airport, to the east;
- Apartment complex and residential areas to the north;
- A commercial business, parking facilities, and UTC/P&W manufacturing to the south; and
- Predominantly commercial areas with some residential to the west (across Main Street).

1.2.1 Site Description

Willow Brook is a small stream transecting the UTC/P&W facility from the northern portion of the Rentschler Airport through to the northwest portion of the current UTC/P&W operations complex. Willow Brook flows in a southwesterly direction in an open channel from the Rentschler Airport, is then hard-piped underground to the inlet of Willow Brook Pond, and continues from the pond as an open channel to a culvert under Main Street. From Main Street, Willow Brook flows in an open channel for a distance of approximately 2,500 feet to the confluence with the Connecticut River (see Figure 1-1). Willow Brook Pond is a man made water body located in the northern portion of the Site (See Drawing 1-1). The pond, a single body of water when first created, has been modified various times through the years. It is now comprised of two ponds subdivided by a culvert.

Known water discharges to surface water that have existed at one point in time or another at the P&W East Hartford Facility include Discharge Nos. 001 through 015. The principal discharge from the facility is Discharge 001. Discharge 001 is the discharge of effluent from the dilute wastewater treatment plant at Colt Street. The other water discharges are permitted through the National Pollutant Elimination System (NPDES) program and are comprised mostly of cooling water and stormwater runoff. Only Discharge Nos. 001 through 004 and 007 through 009 are or were associated with Willow Brook or Willow Brook Pond. These discharges contained basement dewatering, industrial waters and process wastewater. Some of the discharges to the pond were routed through an oil/water separator. A map showing site wide discharge locations was previously provided in the *Work Plan for Willow Brook and Willow Brook Pond PCB Investigation*, prepared by LEA and dated December 12, 1997.

The majority of the water historically drawn from Willow Pond was used in buildings as a source of process water. The water was then collected and rerouted back to Willow Pond via NPDES discharge 003 and 004 and the Willow Brook via NPDES discharge 002. Historically water has discharged through the Experimental Test Airport Laboratory (ETAL) to Willow Brook upstream of Willow Pond. Basement dewatering operations and industrial waters had discharged through an oil/water separator into the brook. This building has been demolished and the oil/water separator water was removed.

During routine draining of Willow Brook Pond in September 1997, an oil sheen was noticed seeping through the sediment. P&W reported the sheen to the United States Coast Guard and the CTDEP in accordance with discharge reporting requirements. Following the detection of PCBs in a sample, the CTDEP issued P&W a NOV, No. PCB 97-08, on November 7, 1997. In response to the NOV, UTC/P&W developed a sampling work plan and conducted three phases of remedial investigation from December 1997 to April 1999. These investigations identified the probable sources and provided the analytical data to sufficiently define the horizontal and vertical limits of contamination allowing development of a remediation plan.

1.2.2 Physical Setting

Physiography

The UTC/P&W East Hartford facility lies within the Central Lowland province of Connecticut, a north-south trending valley system, which is approximately 20 miles wide at East Hartford. The valley system consists of a series of parallel valleys separated by linear north-south trending ridges. The Connecticut River flows southward just west of the site and drains the northern part of the valley system, ultimately discharging to Long Island Sound. The Connecticut River Valley, which is 5 to 6 miles wide and flat (local relief on the order of 30 feet), has created a broad floodplain and eroded terraces in the flatter portion of the valley system. The central portion of the Connecticut River Valley was occupied during deglaciation of the area by a large glacial lake. This lake, known as Glacial Lake Hitchcock, was formed during the northward retreat of the last continental ice sheet and existed about ten thousand years ago.

A regional drainage divide between the Connecticut River Basin and Hockanum Regional Basin lies to the north of the site and approximately 3 miles to the east of the site. The Hockanum River is a tributary of the Connecticut River.

Surface Water

From a review of the "Water Quality Classifications Map of Connecticut," published in 1987 by the CTDEP, surface water quality in Willow Brook has been designated as "B" along its entire reach to the

confluence with the Connecticut River. As noted, the Willow Brook/Connecticut River confluence is approximately 2,500 feet from the Main Street culvert. The "B" designation indicates Willow Brook is known or presumed to meet water quality criteria for recreational use, fish and wildlife habitat, agricultural and industrial supply, and navigation. The Connecticut River has been designated "SC/SB." This designation indicates that the water quality in the river does not presently meet class "SB" water quality criteria for one or more designated uses, but the goal is to meet class "SB" criteria. Designated uses for class "SB" include potential for certain fish and wildlife habitat, recreational boating, industrial supply, and other legitimate uses including navigation.

Storm water

Surface water drainage in the immediate vicinity of Willow Brook and Willow Brook Pond is predominantly overland sheet flow. Storm water in the adjacent plant area is handled by a number of catch basins, roof drainage systems, and storm drain pipelines, which discharge directly into Willow Brook or through an oil/water separator prior to discharge to Willow Brook. The Flood Insurance Rate Map, prepared by the Federal Emergency Management Agency and dated October 23, 1981, for East Hartford, Connecticut (Community No. 090026 0003-D Panel 3 of 4), shows the projected 100-year floodplain of the Willow Brook area. Most of the flood-prone areas depicted along Willow Brook lie between the 100-year to 500-year floodplain.

Meteorology

The climate of central Connecticut is a cool, humid, modified oceanic type. Winters are long and moderately cool; summers are short and mild. The mean annual temperature is approximately 50 degrees Fahrenheit (°F), ranging from an average of approximately 28°F in January to an average of 73°F in July. The average annual precipitation of approximately 44 inches is fairly evenly distributed throughout the year (National Oceanic and Atmospheric Administration, 1990); snowfall is about 40 inches per year (Soil Conservation Service, 1962). The prevailing wind is from the south or southwest in spring and summer and from the north or northwest the rest of the year.

1.2.3 Regional and Site Geology

Regional Geology

The geology of the region consists of sedimentary and igneous bedrock overlain by unconsolidated sediments. The UTC/P&W East Hartford facility is situated in the central portion of the Hartford Basin of the Newark Terrain. The rocks of the Hartford Basin were originally deposited as sediments or as the result of volcanic activity in a rift valley setting. The bedrock stratigraphy consists of four terrigenous sedimentary rock formations: the New Haven, Shuttle Meadow, East Berlin, and Portland. These units are composed of interlayered reddish siltstones, sandstones, and conglomerates. The sedimentary formations are separated from each other by three laterally continuous basalt units: Talcott, Holyoke, and Hampden Basalts. The bedrock layers dip gently eastward and are crosscut by numerous steep faults.

The unconsolidated sediments in much of the region can be divided into three major units: glacial till and limited deposits of stratified sand and gravel, glaciolacustrine deposits, and post-glacial fluvial deposits. These three units were deposited in this order, with the till and the limited stratified sand and gravel deposits generally lying directly over bedrock.

The till is poorly sorted and varies widely from a non-compact mixture of sand, silt, gravel, and cobbles with trace amounts of clay to a compact mixture of silt and clay with some sand, gravel and cobbles. The till is typically less than 10 feet thick in the vicinity of the UTC/P&W facility. The stratified sandy sediments (stratified drift) are much less extensive than the till and usually consist of sand, gravel and silt deposited by melt water in contact with or in front of the glacier. These sediments appeared to be of limited extent and occurred in relatively thin layers (less than 10 feet) beneath the UTC/P&W facility.

Glaciolacustrine deposits include both lake-bottom sediments consisting of silt and clay and sand and gravel deposits formed by beaches and deltas in the lake. Thicknesses of lacustrine clays and silts as great as 270 feet have been reported beneath the UTC/P&W facility. These deposits are thickest in areas of deep bedrock valleys, one of which trends north-south and underlies the Main Plant Area. In a few isolated cases, thin layers of gravelly sands have been documented within the deeper portion of the glaciolacustrine unit.

Post-glacial fluvial sediments generally consist of sand and gravel deposited as the Connecticut River flowed across the exposed lake bed and cut stream terraces into the exposed lacustrine clays and silts, creating stream terrace deposits. These deposits are laterally extensive over the UTC/P&W facility, and are typically 15 to 30 feet thick across the facility.

Site Geology

Bedrock beneath the UTC/P&W facility consists of red sandstone and siltstone of the Portland Formation. Depth to bedrock within the facility boundaries is over 300 feet in the Main Plant Area, and approximately 30 feet along the eastern property boundary. Near the western property boundary along the Connecticut River, depth to bedrock is about 150 feet. A north-south trending, buried bedrock valley underlies the UTC/P&W facility; this buried valley may have been a pre-glacial channel of an ancient river following a similar course to that of the Connecticut River.

A thin layer of glacial till, up to 10 feet thick, typically directly overlies bedrock. A gravelly sand stratified drift deposit has been reported above or in place of the till in a few isolated instances.

Glaciolacustrine lake bottom sediments occur over most of the UTC/P&W facility, and range in thickness from 9 to 270 feet. These deposits thicken towards the central part of the facility (near the Main Plant Area) and are generally absent near the eastern boundary of the site.

The deposits consist of laminated (varved) silts and clays with red fine sand partings. The color varies from gray near the surface to red at the base of the unit. The presence of local sand or gravel lenses within the glaciolacustrine unit near its base has also been reported, but these are not assumed to be laterally extensive.

Beneath the eastern portion of the site, the contact between the silt and clay and overlying sediments is distinct. However, in the Main Plant Area, an intermediate layer of fine sand and silt that varies in thickness from approximately 5 to 20 feet occurs between these two deposits. A similar zone may occur at the base of the glaciolacustrine unit as well; these zones are typical of depositional facies changes that are characteristic of the depositional environment (glaciolacustrine).

Post-glacial fluvial deposits on the UTC/P&W facility are floodplain sediments of the Connecticut River. As the river cuts a channel through the floodplain, terraces were formed along the banks. The stream terrace deposits occur across the facility and generally range from 15 to 30 feet in thickness. These

deposits increase in thickness toward the central part of the facility where greater erosion of the top of the glaciolacustrine silt and clay may have occurred along a former (perhaps earlier post-glacial), abandoned channel of the Connecticut River. These deposits generally consist of uniform brown fine, or fine-to-medium, sand. More recently deposited laminated silt and sand (alluvium) occurs near the western boundary of the site. This alluvium is thickest near the Connecticut River and likely interfingers with the older stream terrace deposits. Other recent alluvial deposits are found scattered across the facility near existing and former streams or wetland areas.

1.3 Summary of Previous Investigations

This section presents a summary of the three previous phases of investigation conducted at Willow Brook and Willow Brook Pond from December 1997 to April 1999. A summary of the analytical results for the entire sampling program is included as Appendix A in a series of detailed site plans developed by LEA during the remedial investigation.

The investigations identified some probable sources and provided the analytical data to define the horizontal and vertical limits of contamination in sufficient detail to allow for the development of a remediation plan. Figures 1-2 and 1-3 present an overview of the delineation of the extent of PCBs in soil and sediment within and immediately surrounding Willow Brook and Willow Brook Pond.

Phase I: *Report on PCB Investigation for Willow Brook and Willow Brook Pond Sediment*, prepared by LEA, dated February 13, 1998. The purpose of this report was to present the findings of the PCB investigation conducted on Willow Brook and Willow Brook Pond sediment in order to address the requirements of item (1) of the third paragraph of the NOV, No. PCB 97-08 issued by the CTDEP and dated November 7, 1997. The sampling was performed in accordance with the *Work Plan for Willow Brook and Willow Brook Pond PCB Investigation*, prepared by LEA and dated December 12, 1997, and approved by the CTDEP on December 22, 1997.

The report describes the field activities performed based on a predetermined sampling grid and presents the analytical results of the investigations. A Toxic Substances Control Act (TSCA) sampling grid was developed to specify the number and location of samples for the investigation in accordance with USEPA's guidance document *"Field Manual for Grid Sampling of PCB Spill Sites to Verify Cleanup"*. Two separate sampling grids were prepared for the east and west surface water bodies of Willow Brook Pond. The sampling was performed in accordance with the approved Work Plan, with the exception that the pond was not drained in response to CTDEP's concerns about sediment disturbance. Detectable PCB values on the sediment samples collected ranged up to a maximum concentration of 617 ppm total PCBs at sampling point WT-SD-33, located immediately downgradient of the subsurface connector between the eastern and western surface water bodies comprising Willow Brook Pond. Relatively high PCB concentrations were also observed in sediment samples collected in the vicinity of this location in both water bodies. Relatively elevated PCB concentrations were also observed along Willow Brook immediately downstream of Willow Brook Pond. A total PCB concentration of 327 ppm was observed in the sediment at location WT-SD-54. The results of the investigations indicated the presence of elevated PCB concentrations throughout Willow Brook Pond and in the section of Willow Brook between the pond and Main Street. The PCB concentrations observed beyond that point were below 1 ppm.

Selected sediment samples were also analyzed for volatile organic compounds (VOCs), semi volatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH), and the RCRA eight metals (arsenic, barium, cadmium, chromium, mercury, lead, silver, selenium) plus nickel, zinc.

Among the limited sediment samples analyzed for these parameters, elevated levels of SVOCs were detected in the sediment at location WT-SD-47 in the eastern water body of Willow Pond. Some of the highest SVOC concentrations reported in that sample included pyrene (480 mg/kg), phenanthrene (514 mg/kg), fluoranthene (537 mg/kg), chrysene (232 mg/kg), etc. Some of the highest metal concentrations observed in this location included lead (153 mg/kg), zinc (152 mg/kg), barium (37.7 mg/kg), and nickel (36.4 mg/kg), etc. The only VOC compounds identified in this location included trichloroethylene (23 µg/kg), tetrachloroethylene (11.6 µg/kg), 1,1,1-trichloroethane (9.7 µg/kg), and 1,1-dichloroethane (10 µg/kg). Generally lower SVOC and VOC concentrations were observed in the other locations samples.

Elevated TPH concentrations were observed at WT-SD-47 (1,160 mg/kg) and WT-SD-09 (4,340 mg/kg and 3,940 mg/kg in the duplicate). Relatively elevated metal concentrations were also observed at this location (zinc 772 mg/kg and 689 mg/kg in the duplicate, nickel 595 mg/kg and 593 mg/kg in the duplicate, lead 714 mg/kg and 691 mg/kg in the duplicate, chromium 490 mg/kg and 497 mg/kg in the duplicate).

It should be noted that no sediment was encountered in upstream accessible locations along the Willow Brook conduit to allow sample collection. Several manholes along the subsurface conduit were opened to confirm no sediment had accumulated within the conduit. Historical measurements have indicated non-detectable PCB levels in sediment samples collected from upstream brook locations, prior to the conduit.

Based on the results obtained, additional investigations were determined to be necessary to better characterize the vertical extent of the contamination within Willow Brook and Willow Brook Pond and to identify potential nearby sources of contamination.

Phase II: *Report on Supplemental PCB Investigation for Willow Brook and Willow Brook Pond*, prepared by LEA, dated April 1998. The purpose of this report was to present the findings of the supplemental PCB investigation conducted on Willow Brook and Willow Brook Pond. The supplemental soil and sediment sampling was performed to identify potential nearby sources of contamination and to provide information of the vertical extent of the contamination within Willow Brook and Willow Brook Pond. An overview of the investigation of the potential source areas and the delineation of Willow Brook and Willow Brook Pond sediments is as follows:

Southwestern bank of Willow Brook Pond: This area was investigated to determine if infiltration or seepage from historic sludge drying beds located to the south of Willow Brook Pond was a potential source. Four soil borings were also installed at the southwestern bank of Willow Brook Pond downgradient of the historic sludge drying beds. The borings were advanced to a depth of 20 to 24 feet from the western bank of the pond. Low total PCB concentrations (up to about 2 ppm) were detected in the borings installed along the southwestern bank of Willow Brook Pond. These concentrations did not appear to be indicative of a source of PCB contamination.

Area of Former Oil Basin area, within the western section of Willow Brook Pond: This area was investigated to determine if infiltration or seepage from historic operations in the pond area was a potential source. The existing oil-water separator is currently operating in this area. Four soil borings were installed in the vicinity of the area of Former Oil Basin, the small embayment west of the Process Water Facility and south of the lower section of Willow Brook Pond. Two of these borings were installed on top of the bank immediately to the south of the area of Former Oil Basin using a Geoprobe® and advanced to a depth of 20 to 24 feet. The other two were installed by hand to a depth of 2 to 8 feet in the immediate proximity of the existing oil/water separator. PCBs were detected in the soils collected from

the four soil borings; however, the highest total PCB concentrations were of the order of 1.3 ppm. These concentrations do not appear to be indicative of a source of contamination.

Former Oil-Water Separator, located historically in the area between the two sections of Willow Brook Pond: This area was investigated to determine if infiltration or seepage from historic operations in the Pond area was a potential source. Five soil borings were installed in the vicinity of the Former Oil-Water Separator in between the two sections of Willow Brook Pond to identify potential historic sources of PCB contamination. The soil borings were installed using a Geoprobe® to a depth of approximately 20 feet. Soil samples were collected every 2 feet and screened visually for the presence of oil. Three samples were submitted for analysis from each boring. Elevated total PCB concentrations were observed in the soil samples from this location. The total PCB concentration observed in this area ranged up to 128 ppm (location WT-SB-88) at a depth of 10 to 12 feet. Free oil was also observed in this location. However, the oil was not extracted from the soil matrix for analysis. The highest PCB concentrations were observed at a depth of approximately 8 to 12 feet below ground surface corresponding approximately to the depth of the water and sediment within the pond, and the approximate level of the water table in the area. These concentrations and findings from this area are indicative of a probable source. It should be noted that the contamination might have originated from multiple sources.

Sediment Sampling: In-depth sampling was also performed within the eastern and western water body of Willow Brook Pond, and along Willow Brook in the vicinity of the wetlands area, and in the wetland area within UTC/P&W's property. These samples were collected to develop at-depth profiling information. It should be noted that only surface sediment samples were collected during the initial Phase I investigation. A 5-foot core was used for collection of the sediment and underlying soil samples during Phase II. Generally, one sediment and two soil samples of the underlying soil were selected from each sampling location. Detected total PCB concentrations within the two sections of Willow Brook Pond (east and west) ranged in concentrations up to 258 ppm in the upper 0- to 2-foot interval. The highest concentration was observed in location WT-SD-72 near the pond's effluent point. Approximately 73.5 ppm of total PCBs were detected at a depth interval of 2 to 4 feet in location WT-SD-78, located at the eastern portion of Willow Brook Pond. Significantly lower and/or non-detectable levels were observed at greater depths. PCB concentrations remained at detectable levels at certain locations at depths up to 8 or 12 feet. Total organic carbon (TOC) concentrations up to 162,000 mg/kg were detected in sediment samples within Willow Brook Pond (location WT-SD-75 at a depth of 0 to 2 feet).

The total PCB concentrations detected in Willow Brook in the vicinity of the wetlands area and within the wetlands for surface samples (0 to 6 inches) ranged in concentration from 44 ppm up to 299 ppm (location WT-SD-92). The total PCB concentrations observed in the at-depth samples (1.5 to 2.0 feet) were significantly lower ranging from 2.6 ppm to 5.7 ppm.

Additional investigations were then proposed, focusing on the areas where the highest levels of PCB contamination were identified to further investigate and define the extent of contamination.

Phase III: *Report on PCB Investigation for Willow Brook and Willow Brook Pond*, prepared by LEA, dated April 1999. The purpose of this report was to present the findings of the third phase of PCB investigations in Willow Brook and Willow Brook Pond. During this phase, soil samples were collected from soil borings and monitoring wells installed in the vicinity of Willow Brook Pond. In addition, surface sediment and soil samples to depths of up to 6 feet were collected along the banks of Willow Brook. Soil/sediment samples were collected from the wetland area at Willow Arms and from other adjacent residential properties along the portion of Willow Brook, which lies downstream of Willow

Brook Pond and to the east of Main Street. Groundwater sampling was also performed in monitoring wells installed at the perimeter of Willow Brook Pond.

Willow Brook Pond Perimeter Sampling: Twelve soil borings and eight monitoring wells were installed in the vicinity of Willow Brook Pond to assess the lateral extent of the contamination. The borings and monitoring wells were installed using a Geoprobe® to a depth of approximately 20 feet. Hand borings to an approximate depth of 12 feet were installed in locations inaccessible by the Geoprobe®. Soil samples were collected every 2 feet and screened visually for the presence of oil. Three samples were submitted for PCB analysis from each boring, including the most contaminated one, based on visual observations, and random ones corresponding approximately to the depth of contamination obtained during the previous investigation. Total PCB concentrations of 50.87 ppm were observed to the east of the eastern water body at Willow Brook Pond, along the reinforced concrete pipe that conveys flow from Willow Brook into Willow Brook Pond. Relatively elevated PCB concentrations up to 14.33 ppm were observed in the area of the Former Oil-Water Separator between the two sections of Willow Brook Pond. This is consistent with previous findings and provides delineation of contamination in this area. Elevated concentrations of semi-volatile organic compounds (SVOCs) and select metals have been observed at some locations. The elevated compounds are consistent and appear to be co-located with the elevated PCB concentrations.

PCBs may have seeped into nearby soils at certain locations, for example at location WT-PZ--140 to the north of the larger water body of Willow Brook Pond (3.82 ppm). However, concentrations detected at depth are generally much lower or below detectable levels. The contamination was confirmed to be primarily contained within Willow Brook Pond.

Wetlands and Stream Bank Sampling: Soil/sediment samples were collected from several abutting residential properties along the segment of Willow Brook between Willow Brook Pond and Main Street. The samples were collected at different elevations along the bank of the brook to assess the lateral extent of contamination. Samples were also collected from the wetlands area at the Willow Arms property and from the adjacent portion of UTC/P&W's property. Surface soil/sediment samples were collected in a total of 28 locations. In seven of these locations, hand auger borings were advanced to approximately 6 feet to assess the vertical extent of contamination. Relatively elevated PCB concentrations (up to 596.2 ppm) were observed within the wetland area. Relatively elevated SVOC and select metals concentrations were also observed within this area, and, as stated before, are consistent and co-located with elevated PCB concentrations. The total PCB concentrations typically decrease to less than 1 ppm at a depth of 4 to 6 feet below grade. Similar concentrations were observed in the wetland area within UTC/P&W property. Total PCB concentrations up to 21.77 ppm were detected from sediment within Willow Brook in the off-site properties (downstream of the wetland area). The PCB concentrations observed drop substantially at higher elevations along the bank of Willow Brook, indicating that the contamination is confined within the brook and the wetland. PCB concentrations decrease to less than 1 ppm prior to Main Street.

Groundwater Sampling: Groundwater samples were collected by LEA personnel from the installed monitoring wells on December 4, 1998. Samples were collected using a peristaltic pump and dedicated polyethylene tubing. Of the eight monitoring wells installed, PCBs were only detected at two locations. PCBs were detected in groundwater from monitoring wells WT-PZ-136 [8.5 parts per billion (ppb)] and WT-PZ-139 (0.73 ppb). These wells are in the vicinity of locations where the highest PCB concentrations in soil have been detected.

Surface Water Sampling: Surface water samples were collected from two locations at Willow Brook Pond (at the pumps from the larger water body prior to entering the facility for non-contact cooling water use and at the dam) and from Willow Brook (downstream of Willow Brook Pond at the intersection with Main Street). No PCBs were detected in any of the surface water samples collected.

1.4 Nature and Extent of Contamination

1.4.1 Soil and Sediment

Overall and with consideration of the data collected to date, PCB concentrations are generally distributed in the brook and pond sediments gradually decreasing in concentration in the downgradient direction. This decrease trends from > 100 ppm in the pond and wetland areas to a concentration of < 1 ppm at Main Street. PCBs were also found in the soils between the two ponds, where the former oil/water separator was located. The vertical extent of PCB impacts has been defined by the sampling conducted, generally achieving non-detect or concentrations < 1 ppm at depths ranging from 4 to 6 feet below grade in the wetland area and 14 to 16 feet below grade in the soil between the upper and lower Willow Brook Pond (in the vicinity of the former oil-water separator). Soil samples collected along and up the banks of the brook and ponds define the horizontal limits of PCB to non-detect or concentrations of < 1 ppm. Figures 1-2 and 1-3 depict the extent of PCB impact in the Willow Brook and Willow Brook Pond area. Within the pond and brook the PCBs are commingled with SVOCs and select metals.

1.4.2 Groundwater

Groundwater samples collected during the remedial investigation identified only two locations where PCB concentrations were above detection limits (WT-PZ-136 at 8.5 ppb and WT-PZ-139 at 0.73 ppb). Well WT-PZ-136 is located in the immediate vicinity of the former oil/water separator and locations of high PCB content in soil. Well WT-PZ-139 is adjacent to an area of elevated PCB in soils. It is expected that removal of soil and source material in these areas will address PCB in groundwater. As these areas and the previously sampled monitoring wells will be removed during RA, post-excavation groundwater monitoring will be conducted to confirm no impacts to groundwater remain following excavation. This monitoring will be conducted through the installation of new monitoring wells in the area.

1.4.3 Surface Water

Surface water sampling from Willow Brook and Willow Brook Pond was performed on February 6, 1998. Samples were collected from Willow Brook Pond at the pumps pumping from the larger water body and dam and from Willow Brook downstream of Willow Brook Pond at Main Street. No PCBs were detected in any of the surface water samples collected.

2.0 STATEMENT OF WORK

The remediation plan for Willow Brook and Willow Brook Pond project as defined in Section 1.0, involves the excavation and offsite disposal of soil and sediment containing total PCB concentrations in excess of 25 ppm. The remediation plan for the wetland area located north of Willow Brook involves the excavation and offsite disposal of soil and sediment containing PCB concentrations in excess of the Residential Direct Exposure Criteria. Following excavation and removal of the impacted soil and sediment within Willow Brook and Willow Brook Pond, a cap consisting of an organic rich soil layer, a gravel layer and a stone layer will be placed within the limits of Willow Brook and Willow Brook Pond. The dam structure between Willow Brook Pond and the open channel section of Willow Brook will remain intact. The area will be restored to much the same configuration as exists today with two ponds (upper and lower Willow Brook Ponds) and an open channel (Willow Brook) from the downstream end of the pond to the cross culvert at Main Street. The existing wetland downstream of the pond will also be restored. Details regarding site restoration and capping are further discussed in Section 2.3.

As noted previously, soil and sediment within Willow Brook and Willow Brook Pond are also impacted by SVOCs, metals, and petroleum hydrocarbons. During the removal of PCB contaminated soil and sediment, a large percentage of the soils and sediment impacted by these constituents will also be removed. Remediation of other constituents of concern found in the remediation areas will be completed in accordance with the Remediation Standard Regulation (RSR), 22a-133k-1 through 3 of the Regulations of Connecticut State Agencies (RCSA). The remediation goals for the ancillary constituents are presented in tabular format in Appendix A and B to 22a-133k-2, more specifically the Industrial/Commercial criteria in Appendix A, the GB Mobility Criteria in Appendix B and/or alternative criteria in accordance with those specific provisions. In any event, any remaining contamination will be capped in accordance with the variance provisions in the RSR as noted previously. Following remediation, UTC/P&W will implement two institutional controls to ensure the long-term protectiveness of the proposed remedy. The institutional controls consist of 1) an Environmental Land Use Restriction to ensure the affected area will not be used for residential purposes and to prohibit excavation and 2) installation of a fence around the entire project area to preclude access to Willow Brook and Willow Brook Pond.

The proposed 25 ppm total PCBs action level within Willow Brook and Willow Brook Pond assumes future use of the remediation area as an open pond to be flanked by green space. However, as noted above, a perimeter fence will be installed to preclude free access to the remediated area. In the event that redevelopment of this area involves a bike path or roadway, the area directly beneath those uses will be remediated to a total PCB concentration of less than the Residential Direct Exposure Criteria. A release of the aforementioned Environmental Land Use Restriction by the Commissioner of the Department of Environmental Protection would be necessary before any redevelopment activities are initiated. Such release would necessitate the preparation of a detailed remediation and restoration plan, which would be consistent with the future proposed use of the subject area or part thereof. Furthermore, should redevelopment of the area necessitate remediation to less than the Residential Direct Exposure Criteria, appropriate barriers (i.e. fencing or railings) would be installed between the capped areas and the areas remediated to less than the Residential Direct Exposure Criteria.

2.1 General

This section details the work to be completed during the project. The section begins with a discussion of pre-construction activities including the application for necessary Federal, State of Connecticut and Town of East Hartford permits to complete the work, and the design of the project. This is followed by a

discussion of the construction activities including site preparation, the demolition and removal of existing structures, contaminated soil and sediment excavation and offsite disposal, wetlands restoration, site restoration activities, implementation of institutional controls, and record keeping and reporting. The last part of this section details post-construction activities. This includes a discussion on the preparation of a post-remediation report detailing the remediation activities and a post-remediation groundwater monitoring program.

2.2 Pre-Construction Activities

This section contains a description of those activities that will be completed prior to the initiation of PCB removal activities at the site. The pre-construction activities are presented in three general categories: project permits, engineering design, and health and safety plan.

2.2.1 Project Permits and Approvals

Prior to the initiation of construction activities and the completion of design activities, it will be necessary to obtain permits from a variety of regulatory agencies maintaining jurisdiction over the work. The agencies include the Army Corps of Engineers, the State of Connecticut Department of Environmental Protection, and the Town of East Hartford Inland Wetlands, and Planning and Zoning Commissions.

US Army Corps of Engineers

The work of this project involves the excavation of nearly 12,500 cubic yards of contaminated soil and sediment from within Willow Brook and Willow Brook Pond. The majority of the excavation activities occur within the two ponds, within the wetlands west of the ponds, or immediately adjacent to these areas. The construction activities will result in the disturbance of greater than 1-acre of wetlands within and immediately abutting the work. A permit from the Army Corps of Engineers is necessary prior to performing a construction activity that impacts greater than 1-acre of inland wetlands. In consideration of the fact that the project will result in the disturbance of greater than 1-acre of inlands wetlands, the permit from the Army Corps of Engineers will be sought through the individual permit process. The permit application was filed on February 14, 2001 and is currently under review. As part of this permit application, a public notice was issued. In response to the notice, the Army Corps of Engineers has not received any substantive comments.

Connecticut Department of Environmental Protection

Prior to initiation of the construction activities, it will also be necessary to obtain a permit from the CTDEP Inland Water Resources Division. This permit will address the need to obtain a water quality certification for the excavation/placement of fill within the flood plain and wetlands pursuant to Section 401 of the Clean Water Act. The permit application was filed on February 14, 2001 and is currently under review. Comments from the DEP on the application have been received and addressed in a revised submission. As part of this permit application, a public notice was issued. In response to the notice, the CTDEP Inland Water Resources Division has not received any substantive comments. .

The application to the IWRD was prepared and submitted on forms approved by the DEP and included: a permit application transmittal form; the permit application for programs administered by the IWRD; the technical documentation form; an executive summary; a USGS site location map; a listing of all adjacent property owners;; a soil scientists report; an engineering/hydrogeologic report; flood management

consistency worksheets; an environmental report; an alternatives assessment; a flood contingency plan; and plans and drawings detailing the work.

In addition to the above pre-construction permit, it will also be necessary to register for the General Permit for the Discharge of Storm Water and Dewatering Wastewaters Associated With Construction Activities and the General Permit for the Discharge of Groundwater Remediation Wastewater. The CTDEP Bureau of Water Management issues both General Permits. Registration packages will be submitted to the CTDEP prior to initiation of construction activities. In addition, a Storm Water Pollution Control Plan (a requirement of the storm water general permit) will be prepared prior to the initiation of construction activities.

In addition to the above permits, it will also be necessary to secure an approval for the use of an engineered control to remediate soil and sediment within the project area. The engineered control consists of the pond bottom/sediment, stream channel, and composite caps to be installed following excavation activities within the project area. The request was submitted to the CTDEP on January 5, 2001 in accordance with Section 22a-133k-2(f)(2)(B) of the Regulations of Connecticut State Agencies. The request was a detailed report and plan which was prepared to satisfy the requirements of the above referenced regulatory section and to document that the cost of excavation and offsite disposal of the polluted soil at the site is significantly greater than the cost of installing and maintaining an engineered control and conducting groundwater monitoring. The request further documented that the significantly greater cost outweighs the risk to human health and the environment if the engineered control fails to prevent the mobilization of, or human exposure to the remaining polluted soils. The request is currently under review by the CTDEP. The use of an engineered control is also subject to a public comment process. The public notice of the intended use of the engineered control was advertised on April 28, 2001. To date, no substantive comments have been received.

Town of East Hartford

Prior to the initiation of construction activities, it will be necessary to obtain three permits from the Town of East Hartford. These permits will be issued by the Inland Wetlands, and Planning and Zoning Commissions. The Inland Wetlands Commission permit will be necessary prior to the performance of construction activities within wetlands or within specified distances from a wetland. The Inland Wetlands Commission issued an approval for the project following a public hearing on the application on April 24, 2001.

The Planning and Zoning Commission permits will be in the form of a Major Flood Hazard Permit and a Soil Erosion and Sedimentation Control Permit. The Major Flood Hazard Permit will be necessary prior to performing construction activities within a flood hazard area of the Town of East Hartford. This application was submitted to the Town of East Hartford on May 7, 2001 and is expected to be approved in June 2001. The Soil Erosion and Sedimentation Control Permit must be obtained prior to initiating a construction project, which includes disruption to greater than ½ acre of land in the Town of East Hartford. This application was submitted on May 29, 2001 and is expected to be approved during June 2001. It should be noted, an Excavation Permit will not be necessary, as a special exception has been sought as the construction activities are being undertaken as part of a remediation project.

2.2.2 Engineering and Design

Prior to the implementation of the construction activities at the site, design drawings and technical specifications necessary to support permitting activities will be prepared to depict each phase of the

project. The construction drawings will be used in support of applications to obtain necessary permits as well as to direct the efforts during the construction activities. The technical specifications will be of adequate detail to ensure that each phase of construction is performed in accordance with the terms and conditions of any permits obtained prior to the initiation of construction, this Remedial Action Plan, and other applicable local, state and/or federal requirements. The project is being performed as a design-build effort. As such, detailed design plans and specifications beyond that which is necessary to support the permitting efforts and to establish the performance criteria for the remediation project, are not necessary. The drawings and figures contained herein represent the current status of engineering design for the project. Additional engineering design is not anticipated, other than the anticipated minor field alterations necessitated by changed conditions.

2.2.3 Health and Safety Plan

A Health and Safety Plan (HASP) will be prepared prior to the initiation of construction activities. The HASP will detail safety organization, procedures, and personal protective equipment that are based on an analysis of potential site-specific hazards. The HASP, will meet the requirements of 29 CFR 1910 and 29 CFR 1926 (which includes 29 CFR 1910.120 and 29 CFR 1926.65). The HASP will include, but will not be limited to, the following components:

- Identification of key personnel - All on-site personnel involved with the construction activities at the site will be required to maintain Occupational Safety and Health Administration (OSHA) 40-hour Hazardous Waste Training (29 CFR 1910.120 and 29 CFR 1926.65) and the corresponding 8-hour refresher course update
- Training – A description of health and safety training requirements for supervisory and on-site personnel will be presented. Training requirements will include attending an initial site orientation prior to performing on-site activities
- Medical Surveillance – A description of appropriate medical examinations required for supervisory and on-site personnel.
- Site Hazards – A description of chemical, physical, and climatological hazards associated with the project.
- Work Zones – A description of the work zones that will be established during construction activities.
- Personnel Safety Equipment and Protective Clothing – A description of personnel protective equipment and protective clothing to be used and available on site.
- Equipment Cleaning – The methods and procedures for decontamination of personnel, materials, and equipment will be described.
- Confined Space Entry – A listing of confined spaces and description of procedures for confined space entry in accordance with Permit Required Confined Space Entry (29 CFR 1910.146).
- Excavation Safety – A description of excavation and trenching safety procedures as specified in 29 CFR 1926 Subpart P.
- Standard Operating Procedures and Safety Programs as required by applicable portions of 29 CFR 1910 and 29 CFR 1926.

2.3 Construction Activities

The proposed construction activities involve:

- The excavation and installation of a temporary lined by-pass channel with inlet and outlet structures;
- The demolition of the existing process water facility building structures and the offsite disposal of construction demolition debris;
- The removal and offsite disposal of the former oil/water separator located between upper and lower Willow Brook Pond and the excavation and complete removal of the structure with offsite disposal of impacted soil and concrete and the placement of an engineered control to achieve compliance with the variance provisions in the RSR;
- The excavation and offsite disposal of approximately 8,500 cubic yards of soil and sediment containing total PCBs at concentrations greater than 25 ppm from within and immediately surrounding Willow Brook and Willow Brook Pond;
- The excavation and offsite disposal of approximately 1,500 cubic yards of soil and sediment containing PCBs at concentrations between 1 and 25 ppm from within and immediately surrounding the wetland area located north of Willow Brook;
- The excavation and offsite disposal of approximately 2,500 cubic yards of soil and sediment from within the open channel of Willow Brook to allow for the installation of the geotextile, soil, and stone cap within the stream channel;
- The placement of a geotextile, soil and stone cap (engineered control) over the entirety of the excavated area (with the exception of an approximately 1-acre wetland described below and the footprint of the process water facility) to isolate sediment containing less than 25 ppm total PCBs commingled with semi-volatile organic compounds, petroleum hydrocarbons, and select metals to achieve compliance with the variance provisions in the RSR;
- The restoration of an approximately 1-acre wetland located downstream of the Willow Brook Pond Dam; and
- The implementation of two institutional controls consisting of 1) an Environmental Land Use Restriction to ensure the affected area will not be used for residential purposes and to prohibit excavation; and 2) installation of a fence around the entire area to preclude access to Willow Brook and Willow Brook Pond.

The following parts of this section describe in general each of the anticipated construction activities necessary to complete the remediation.

2.3.1 Site Preparation

Drawing 2-1 presents the general site preparation details associated with this project. The following is a general description of anticipated site preparation activities.

Erosion Control

Appropriate soil erosion and sedimentation control methods (e.g., silt fence, straw bale dikes, absorbent booms, etc. as depicted in Figure 2-1) will be installed to mitigate the transport of suspended solids or sediments downstream. A soil erosion and sediment control plan is a component of applications for local, state and federal permits. Due to the magnitude of excavation to accomplish the removal of contaminated soil and sediment, excavation activities may be suspended during periods of heavy precipitation.

Clearing and Grubbing

The area in the immediate vicinity of Willow Brook and Willow Brook Pond is covered with a variety of vegetation, including the wetland areas (see Drawing 2-1). Vegetation ranges from mowed grass to

mature trees. To gain access to perform the planned excavation activities, clearing and grubbing will be required. Cutting, processing, and appropriate disposal of heavy vegetation will be a component of the project. It is anticipated that stumps from trees located in areas known or suspected to be impacted by PCBs or other constituents will be disposed of at an offsite facility as PCB remediation waste. The remainder of the woody debris will be shipped offsite for volume reduction and/or disposal as a solid waste in accordance with the State of Connecticut Solid Waste Management Regulations.

Decontamination Facilities

Contractor equipment that has been in contact with contaminated soil and sediment will require decontamination prior performing work in an uncontaminated area or demobilization from the site. A decontamination pad or pads will be strategically located at the site adjacent to excavations and vehicle loading areas. Potential locations for decontamination facilities are shown on Drawing 2-1. The decontamination pad or pads will generally be constructed of a wood frame or similar materials, lined with heavy plastic, and include a layer of open stone. Equipment that has come into contact with contaminated soil and sediment will be cleaned with a pressure washer, scrub brushes and organic solvent using a double wash/rinse process in accordance with Subpart S of 40 CFR Part 761 over the decontamination pad.

Durable field sampling equipment (e.g., stainless steel trowels, plastic scoops, shovels, etc.) used to implement the Field Sampling and Analysis Plan will be decontaminated prior to each sample location to mitigate the potential for cross-contamination of samples collected for laboratory analysis. Decontamination will be performed in accordance with Standard Operating Procedures provided as Appendix B and in accordance with 40 CFR Part 761.79(c).

Wash water and detergents used in the decontamination process will be disposed of following pretreatment through a mobile water treatment system (described in more detail later in this document) to the sanitary sewer in accordance with the terms and conditions of the CTDEP General Permit for the Discharge of Groundwater Remediation Wastewater. The terms and conditions of this General Permit require removal of PCBs to a concentration of 1 µg/L, which is more restrictive than §761.79 (c).

Site Security

Limiting access to the site during construction will be accomplished thorough the use of both existing and permanent fencing (refer to Drawing 2-1 and Figure 2-2), along the north side of Willow Brook and Willow Brook Pond, and temporary construction fencing to be installed along Willow Street. The fencing will be supplemented by the use of security personnel to ensure that unauthorized persons do not access the construction site during remediation activities.

2.3.2 Demolition and Removal of Existing Structures

As part of the remedial activities, select buildings and other structures will be demolished (see Drawing 1-1). A list and description of the primary structures to be demolished and removed are as follows:

- Five buildings and components associated with the process water facility; and
- The former underground oil/water separator located between the upper and lower sections of Willow Brook Pond.

Area Preparation

Prior to demolition, a complete survey of the structures and their components will be performed. The survey is necessary to determine decommissioning, demolition, and disposal requirements. UTC/P&W will be responsible for shutdown and removal of components they intend to reuse from the process water facility.

Process Water Buildings

Demolition of the process water facilities will extend to a depth necessary to achieve the project objectives of remediating PCB contaminated soil to meet the Residential Direct Exposure Criteria for soils within 4-feet of the final grade, the Commercial/Industrial Direct Exposure Criteria for soils located in inaccessible locations and the GB Pollutant Mobility Criteria for soils above the seasonal high water table. Other related structures, such as pilings, erosion structures, etc., will also be demolished and removed to a depth necessary to achieve the project objectives. Pipes and utilities connected to these buildings will be abandoned or removed during the demolition activities or during the soil and sediment removal phase of the project. Utilities designated for in-place abandonment will be will be analytically assessed and decontaminated if necessary to achieve a 1 $\mu g/100\ cm^2$, 10 $\mu g/100\ cm^2$, or 25 $\mu g/100\ cm^2$ for abandonment if located in a 1 ppm, 10 ppm or 25 ppm remediation area, respectively. Utilities located within an area of soil remediation shall be excavated and disposed of as bulk remediation waste.

A Civil War marker/gravestone is located to the east of the main water processing building. This feature shall be protected during all aspects of the work.

Former Oil/Water Separator

A buried oil/water separator is located between the upper and lower sections of Willow Brook Pond. This structure and surrounding soils are contaminated with PCBs. The oil/water separator, its contents, and the soil containing greater than 25 ppm PCBs surrounding the structure will be completely removed and disposed of at an offsite location during the project. If a light-non-aqueous phase liquid (LNAPL) is identified during excavation, the remediation of will proceed until the LNAPL is removed in accordance with Section 22a-449(d)-106(f) of the Regulations of Connecticut State Agencies. However, it is anticipated that the presence of LNAPL is coincident with soils containing greater than 25 ppm PCBs and the removal of the LNAPL would be completed during excavation of those soils. Prior to removal of the structure, the oil/water separator will be exposed and any liquids will be removed, characterized, and disposed of at an offsite location.

Available analytical data are sufficient to delineate the three-dimensional extent of soil impacted by PCBs in the vicinity of the oil/water separator. However, the data are not adequate for the purposes of establishing the lateral limits of the composite cap to be installed in this area to address soils impacted by other constituents. As a result, prior to implementing the remediation in this area, soil borings will be advanced to a depth of 15 feet using the Geoprobe®. Soil samples will be collected from each Geoprobe®soil boring and analyzed for PCBs and constituents other than PCBs. The intent of the sampling will be to delineate the three-dimensional extent of other soils requiring remediation for other constituents pursuant to the RSRs. It is anticipated that soil samples will be analyzed for mass and SPLP metals (RCRA 8 plus copper, nickel and zinc), cyanide, VOCs, SVOCs, and TPH. The location of each soil boring is discussed in Section 4.0.

Demolition Debris Management

Further evaluation of the affected structures and components will be performed to determine disposal requirements prior to demolition. Appropriate samples will be collected and submitted for laboratory analysis to characterize the waste for disposal. Any demolition debris characterized as bulk PCB remediation waste shall be disposed of at a chemical waste landfill approved under 40 CFR 761.75The sampling procedures and protocols are further discussed in Section 4.0, Field Sampling and Analysis Plan. It is anticipated that all material removed in the demolition process will be disposed of off site. An expected waste stream summary is presented in Section 4.0.

Soil Sampling and Analysis

Sampling and analysis of certain soils below and adjacent to the subject buildings and structures will be required to confirm horizontal and vertical limits, disposal and handling requirements. Soil confirmatory samples will be collected and analyzed in accordance with the Field Sampling and Analysis Plan presented in Section 4.0. The excavated and staged soil will be sampled for disposal characterization. The soil disposal characterization samples will also be collected in accordance with the Field Sampling and Analysis Plan. All confirmatory and disposal characterization samples will be analyzed in accordance with the Quality Assurance Project Plan in Section 5.0.

2.3.3 Contaminated Soil and Sediment Excavation and Offsite Disposal

This section presents a summary description of the planned soil and sediment excavation and offsite disposal activities. As noted, it is anticipated that approximately 12,500 cubic yards of contaminated soil and sediment will be excavated and disposed of at an offsite location during the project. The proposed by-pass channel was incorporated into this project primarily to facilitate in-situ dewatering and to mitigate potential logistical complications associated with other water handling options. Based on the available historic stream channel bathymetry and utility invert data, the by-pass channel is expected to effectively relieve the groundwater table to an elevation below 21.00 in the pond areas. A field determination will be made based on the percent solids observed in the in-situ material, to excavate the material and direct-load the haul vehicles for off-site disposal, or to excavate the material and stage it in a temporary staging area for further gravity dewatering. The staged material would again be evaluated after a 24-hour period to assess the percent solids. If the percent solids are unacceptable for over-the-road transport, lime will be added to the material to further stabilize it and to achieve compliance with shipping requirements.

If it is determined that material staging in stockpiles is necessary to facilitate the offsite disposal of the contaminated soil and sediment, a material staging and stockpile area will be constructed. The material staging and stockpile area construction and operation is discussed in greater detail below.

Contaminated soil and sediment will be characterized for disposal based on the "as-found" concentration of PCBs. Additional analysis will be performed on stockpile grab samples as needed to satisfy the disposal vendor. The waste will be disposed of based upon the more restrictive analytical data regardless of the as-found concentrations (e.g. if in-situ characterization documents < 50 ppm PCBs and the stockpile data suggests > 50 ppm, the waste disposal profile used for this particular load would be based on the stockpile data). Stockpile analytical data would not be used to reduce any disposal restrictions on the material.

Stream Flow During Construction

The construction project involves the excavation of submerged sediments from within Willow Brook and Willow Brook Pond. Remediation will begin at the upstream pond and progress downstream. To accomplish the excavation, it will be necessary to temporarily redirect flow within Willow Brook.

During construction, all flow entering the PCB remediation work area from the upstream conduit of Willow Brook will be bypassed by the construction of a channel capable of conveying a 100 year flood as defined by the Flood Insurance Study prepared for the Town of East Hartford in January of 1979. The bypass channel will be constructed on the south side of the Willow Brook and Willow Brook Ponds as depicted in Drawing 2-2 and as detailed in Figure 2-3 through 2-5. Provisions will be made to direct local drainage that enters the work area directly from storm sewers on United Technologies Corporation, Pratt & Whitney property on the south side of the work area into the bypass channel. Storm water discharges from municipal and privately owned storm sewers that enter the work area from the north will either be conveyed or pumped around active work areas. During a 500-year flood, the hydraulic gradient above the work area would be higher than the conduit, and the backwater would cause some catch basins to be surcharged above the surface elevation of the inlets upstream of the conduit outlet. Provision has been made to seal the catch basins within the temporary staging and stockpile areas upgradient of the conduit outlet and to block surface flow from entering either the work area or the storage areas.

Dewatering

In addition to water diversion, it is also likely that construction dewatering will be necessary to facilitate the removal of soil and sediment containing greater than 25 ppm total PCBs. Conventional sump or well-point techniques will be employed to allow for spot dewatering of excavation areas. All dewatering wastewater will be containerized, treated as necessary, sampled, then discharged to the Town of East Hartford Water Pollution Control Facility through a sanitary sewer under a general permit, issued by the DEP, for the Discharge of Groundwater Remediation Wastewater to a Sanitary Sewer. The collected water will be pumped to a settling tank within which solids will be separated. Water will be decanted from the settling tank, treated in an onsite mobile water treatment system through a wet-phase carbon adsorption system then discharged. All related monitoring and record keeping shall be implemented as mandated by this general permit. A copy of this general permit is provided as Appendix C.

Excavation Methods

The excavation program will advance from upstream to downstream within Willow Brook Pond and the Willow Brook streambed. The approximate horizontal limits of the soil and sediment removal activities are presented on Drawing 2-3. Based on the prior investigations, it is anticipated that an average of 2 to 3 feet of sediment will be removed from the pond and brook, respectively and up to 4 feet within the wetland area. Soil from depths of up to 16 feet will be excavated in the vicinity of the former oil/water separator. Confirmatory soil samples collected during the remediation will provide the final horizontal and vertical limits of excavation. The soil and sediment excavation will be accomplished through the use of track-mounted excavators, bulldozers, and loaders. It likely that some or all of the equipment will be of a low ground pressure configuration to allow operation within the pond and stream channel.

Once the target soils and sediment have been removed and verified, the excavation will continue in the next remediation area and the placement of the geotextile, soil and stone cap (See Section 2.3.4) can proceed. Should the confirmatory samples indicate that the 25 ppm total PCB limit has not been achieved within the pond and brook or the Residential Direct Exposure Criteria for PCBs within the wetland area,

additional excavation will be performed. Excavation will continue until all soil and sediment containing PCBs at concentrations in excess of 25 ppm within the pond and brook and the Residential Direct Exposure Criteria for PCBs within the wetland are removed.

Soil/Sediment Sampling and Analysis

Sampling and analysis of certain soils/sediments will be required to confirm horizontal and vertical limits, disposal and handling requirements. Soil and sediment confirmatory samples will be collected in accordance with the Field Sampling and Analysis Plan presented in Section 4.0. The excavated and staged soil and sediment will be sampled for disposal characterization. The soil and sediment disposal characterization samples will also be collected in accordance with the Field Sampling and Analysis Plan. All confirmatory and disposal characterization samples will be analyzed in accordance with the Quality Assurance Project Plan in Section 5.0.

Soil/Sediment Staging

During the soil and sediment removal activities the excavated soil and sediment may need to be temporarily relocated into staging areas adjacent to the excavation area for gravity dewatering and lime stabilization as detailed above. The staging areas will consist of a perimeter berm and will be lined with polyethylene and pavement to contain all soils and liquids. Soil and sediment placed within the staging areas shall be covered with a low permeability sheet to limit exposure to precipitation. All water within the staging areas will be collected in a pre-formed sump located at an intentionally defined low spot within the staging area(s). The collected water will be pumped to a settling tank within which solids will be separated. Water will be decanted from the settling tank, treated in an onsite water treatment system through a wet-phase carbon adsorption system then discharged to the Town of East Hartford Water Pollution Control Facility. Sampling, as necessary to comply with the terms and conditions of the general permit for discharge and the Town's discharge requirement will be performed. Prior to initiating the discharge to the sanitary sewer, the treated water will be sampled to ensure that the PCB concentration is less than 1 ug/l and all other constituents comply with the terms and conditions of the general permit.

Stabilization

The excavated soil and sediment shall be staged for dewatering by gravity within a staging area in order to meet applicable requirements for disposal (i.e., no free liquids). It is anticipated that the soil and sediment will be further stabilized utilizing up to six percent lime by weight, only if necessary. Lime will be evenly incorporated into the excavated soil and sediment via mechanical mixing. This stabilization process is intended to facilitate the legal shipping of the contaminated material over-the-road to a permitted offsite disposal facility.

Off-Site Disposal

It is anticipated that all soil and sediment excavated as part of this project will be shipped to an offsite facility for disposal. The offsite disposal includes handling, storing, containerizing, transporting (including providing and preparing manifests, bills of lading, etc.) and disposing of excavated soil and sediment. The excavated soil and sediment will be transported via a licensed waste hauler to a permitted chemical or solid waste disposal facility dependant on the waste characterization. The estimated in-place volume of soil and sediment requiring offsite disposal is 12,500 cubic yards.

Dust-Control

Included as Appendix D is a project-specific Dust Control Plan. This plan establishes the activities that will be performed to minimize the potential exposure to unacceptable levels of airborne contaminants during the work.

2.3.4 Pond/Stream Channel Cap, Engineered Control, Wetland Restoration

Following the excavation and demolition activities, Willow Brook and Willow Brook Pond will be restored. The planned restoration activities are described in detail below and depicted on Drawings 2-4 and 2-5 with related details and sections presented in Figures 2-6 through 2-8. The site restoration involves the installation of 3 types of caps/engineered controls over soil and sediments remaining following excavation and removal of those containing total PCBs at concentrations greater than 25 ppm. The cap details were derived based on the anticipated stream flow velocities and considered the ultimate use of the area as a combined wetland, pond, and stream channel. The base of each cap consists of a non-woven geotextile, a 9-inch layer of organic rich soil, and a non-woven geotextile. This layer is referred to below as an organic-rich layer. This organic-rich layer is included as a contingency to mitigate any potential for PCBs to migrate vertically upward through the proposed soil and rock cap. The caps are described below and are depicted on Figures 2-6 through 2-8.

- Within Willow Brook Pond, a 36-inch soil and stone cap is proposed (refer to Drawing 2-4 and Figure 2-6). The cap will consist of a 9-inch organic rich layer, 21 inches of process gravel, and a 6-inch layer of 4-inch stone. As the flow velocity in Willow Brook Pond is extremely low and is controlled by the dam at the outlet to the pond, the stone lining will provide adequate protection against erosion.
- Within Willow Brook (downstream of the dam), a 36-inch soil and stone cap is proposed (refer to Drawing 2-4 and Figure 2-7). The cap will consist of a 9-inch organic rich layer, a 15-inch layer of modified rip-rap and a 12-inch layer of cobbles, gravel and coarse sand. The 15-inch layer of modified rip-rap extends the width of the channel bottom and transitions into a 24-inch layer of intermediate rip-rap on the side slopes of the channel banks. The 24-inch layer of modified rip-rap extends up the channel banks to the elevation of the 10 year flood. The rip-rap channel lining has been designed to withstand the erosive forces anticipated in the stream channel following completion of the construction project.
- The area of the underground oil/water separator will be provided with a composite cap (refer to Drawing 2-4 and Figure 2-8). The composite cap will consist of a 40-mil flexible membrane liner, a geotextile drainage layer, 30-inches of granular backfill, and a 6-inch loam and seed layer.
- In addition to the above, the wetland north of Willow Brook will be restored by providing a soil and wetland sediment cap consisting of 24 inches of granular fill, and 12-inches of wetland soil. The wetland will be planted with native wetland plants (refer to Drawing 2-4 and Figure 2-9).

In response to a request by the Department of Environmental Protection (DEP) staff, the Willow Brook stream channel will be slightly modified between the dam that impounds Willow Brook Pond and Main Street to reduce the slope of the banks to control potential erosion and to modify the character of the channel bottom to create a low flow channel with pools and eddies. The limits of these improvements are shown on Drawing 2-5.

2.3.5 Site Restoration

Following the completion of the excavation and offsite disposal of contaminated soil and sediment, all areas disturbed by construction will be restored. The restoration of the waterway and wetland were previously described. It is anticipated that restoration activities for area outside the waterway and wetland will consist of the installation of paved parking areas or grassed areas. Planned final site restoration is presented in Drawing 2-4.

The future site use options may consist of the following:

- Additional automobile and/or truck parking; and
- Relocation/rerouting of Willow Street to the northern portion of the property as indicated on Figure 2-10.

Following restoration activities, UTC/P&W will implement two institutional controls to ensure the long-term protectiveness of the proposed remedy. The institutional controls consist of 1) an Environmental Land Use Restriction to ensure the affected area will not be used for residential purposes and to prohibit excavation and 2) installation of a fence around the entire area to preclude access to Willow Brook and Willow Brook Pond (refer to Figure 2-5 and Drawing 2-4).

In the event that redevelopment of this area involves a bike path or roadway, the area directly beneath those uses will be remediated to a total PCB concentration of less than the Residential Direct Exposure Criteria. A release of the Environmental Land Use Restriction by the Commissioner of the Department of Environmental Protection would be necessary before any redevelopment activities are initiated. Such release would necessitate the preparation of a detailed remediation and restoration plan, which would be consistent with the future proposed use of the subject area or part thereof. Furthermore, appropriate barriers (i.e. fencing or railings) would be installed between the capped areas and the areas remediated to a concentration less than the Residential Direct Exposure Criteria.

2.3.6 Record Keeping and Reporting

The following records will be maintained during construction to document the remedial activities:

1. The delineation of the final horizontal and vertical limits of the soil and sediment removal activities;
2. A photographic record of construction progress;
3. Records of all quality assurance/quality control (QA/QC) testing performed;
4. A record of all field screening and confirmatory sampling and analytical results, including sampling methods, locations and depths, frequency, and analytical results;
5. Results of all waste disposal characterization samples of excavated materials;
6. Results of all samples of treated effluent from the temporary on-site wastewater treatment system;
7. A record of all daily activities; quantities of materials removed, generated, used, and disposed of; and document manpower, material, and equipment used;
8. A record of all materials and equipment delivered to the site; and
9. Copies of all hazardous waste manifests, non-hazardous waste bills of lading, and certificates of disposal for wastes generated during the project.

2.4 Post-Construction Activities

The following is a general description of the post-construction activities. It is anticipated that the post construction activities will include the preparation of a report documenting the remediation of the site and the implementation of a post-remediation groundwater monitoring program.

2.4.1 Post-Remediation Reports

A post remediation report will be prepared for submission to the appropriate regulatory agencies. The report will contain a detailed description of remediation activities, confirmatory samples, offsite disposal documentation, appropriate figures and drawings, and analytical data tables presenting results of confirmatory samples. The post remediation report will be prepared to provide a full accounting of all activities performed and documentation necessary to support the conclusion that the remedial activities met the objectives of this Remedial Action Work Plan. The report will be submitted to the CTDEP and EPA for review and ultimate approval. A separate report will be generated to satisfy the project closeout reporting requirements of the wetlands restoration efforts. The project closeout report is a likely condition of a permit or approval issued by the Army Corps of Engineers.

2.4.2 Post Remediation Groundwater Monitoring Program

Following completion of remedial activities, it will be necessary to perform post remediation groundwater monitoring of groundwater in the vicinity of Willow Brook and Willow Brook Pond. A Post-Remediation Groundwater Monitoring Program has been developed and submitted to the CTDEP and EPA. The Post-Remediation Groundwater Monitoring Program specifies groundwater monitoring wells to be sampled, field collection and analytical methods, quality assurance/quality control procedures, program duration, and reporting requirements. It is anticipated that post-remediation groundwater monitoring will be performed on a quarterly basis for a period of not less than two years.

3.0 PROJECT SCHEDULE

The anticipated completion dates for major project activities are as follows:

• Permits from US Army Corps of Engineers, CTDEP and East Hartford	June 2001
• Site Remediation Construction Period	December 2001
• Site Restoration/Establishment of Vegetation	June 2002
• Post Remediation Report, filing ELURs and Groundwater Monitoring Plan	June 2002

A detailed project schedule is included as Figure 3-1.

4.0 FIELD SAMPLING AND ANALYSIS PLAN

4.1 Introduction

4.1.1 General

This plan addresses the field procedures, samples to be collected, sample type, sample location and the sample collection methods to be used during implementation of the remedial activities outlined in the RAWP. The Quality Assurance Project plan (QAPP), is presented in Section 5.0.

4.1.2 Objectives of the Sampling and Analysis Plan

The overall objective of the sampling and analysis program is to provide analytical data that verify the achievement of the remediation goals for the site. The sampling program has been developed in consultation with the requirements presented in 40 CFR Part 761 Section 761.61 (c), 40 CFR Part 761 Subpart O, and the documents entitled *Verification of PCB Spill Cleanup By Sampling and Analysis*, EPA August 1985 and *Field Manual for Grid Sampling of PCB Spill Sites to Verify Cleanup*, EPA May 1986. The objective of this risk managed remediation program is to remove PCB-impacted soil exhibiting concentrations in excess of 25 ppm and place a 3-foot cap over the residual contamination areas (i.e., those areas that exhibit PCB concentrations less than 25 ppm). The proposed caps were described in previous sections. The portion of the wetlands to the north of the Willow Brook stream channel will be excavated to a PCB concentration less than the Residential Direct Exposure Criteria. Based on the objectives of the remediation program, the following specific objectives have been established for the sampling and analysis program:

- Confirm that PCB concentrations remaining in soil/sediment at the limits of the excavation are consistent with the Remedial Action (RA) objectives; and
- Determine the handling and disposal requirements for the soil/sediment and miscellaneous materials generated during implementation of the RA.

4.1.3 Overview of the Sampling and Analysis Program

Analytical results associated with samples collected as part of the RA activities will be used to document that the objectives of the RA have been satisfied. Samples that will be collected as part of the RA will consist of the following:

- Post-excavation soil/sediment samples to confirm the successful implementation of the RA and document residual contamination concentrations;
- Post PCB excavation soil sampling to confirm the limits of soil requiring remediation pursuant to the RSR (as a result of other constituent concentrations) in the vicinity of the former oil/water separator and the wetland area;
- Concrete disposal characterization samples;
- Soil/sediment disposal characterization samples for verification of constituent concentrations ; and

- Miscellaneous material samples for the assessment of disposal options and/or treatment performance (e.g., the temporary wastewater treatment system) associated with the implementation of the RA.

The location of the characterization samples performed and PCB isoconcentration contours are shown on Figures 1-2 and 1-3 for Willow Brook and Willow Brook Pond, respectively. The proposed sampling grid for the confirmatory samples to be collected is shown schematically in Figure 4-1. The proposed layout for the confirmatory sampling is presented on Drawing 4-1. In addition, disposal characterization samples will be collected from excavated materials associated with the RA.

4.2 Remedial Action Field Sampling

4.2.1 General

Details associated with implementing the Field Sampling Program (FSP) are presented in this section. The following information concerning the FSP is also provided:

- Proposed sample grid, sample identification numbers, and sample type;
- Procedures for sampling and for measuring field parameters; and
- A summary of the data to be generated from each sampling effort, including field and analytical parameters.

Detailed information regarding the RA field sampling including the number/type of environmental samples and quality control samples to be collected, sample intervals, analytical parameters, sample containers, preservation, and holding times are presented in tables located at the end of this section. A description of these tables is provided below:

Table No.	Title	Contents
4-1	Confirmatory Sample Summary	Presents the sample media, anticipated number of samples to be collected from the excavations, the sampling frequency, anticipated sample depth, and laboratory analytical parameters.
4-2	Quality Control Analyses Summary	Indicates the number and type of quality assurance/quality control (QA/QC) samples, which will be required.
4-3	Sample Containers, Preservation, and Holding Times For Soil/Sediment and Water Samples	Indicates the appropriate sample containers, preservation methods, and holding times for the samples to be collected.

All sampling activities will be performed in accordance with the Loureiro Engineering Associates, Inc. Standard Operating Procedures provided in Appendix B.

4.2.2 Post-Excavation Confirmatory Sampling

Post-excavation confirmatory sampling of soil/sediment will be conducted in the areas to be excavated (Drawing 2-3) to confirm that residual PCB concentrations do not exceed the RA objectives at the limits of the excavations (25 ppm PCBs in all areas to be capped, GB Pollutant Mobility Criteria for all soils above the seasonal high water table and the Commercial/Industrial Direct Exposure Criteria in inaccessible soil locations within and immediately adjacent to the process water buildings, and the Residential Direct Exposure Criteria in the wetland area to the north of the stream channel and within the upper 4-feet from final grade within the process water facility area). The proposed layout for the confirmatory sampling is presented on Drawing 4-1. Confirmatory soil sampling will be performed throughout the project as necessary to document the adequacy of the remedial measures as proposed.

PCB Confirmatory Soil Sampling – Engineered Control Areas

Post-excavation confirmatory soil/sediment samples for PCBs will be collected from the bottom and sidewalls of the excavated areas which will be located beneath the engineered controls within Willow Brook. Willow Brook Pond, and the oil-water separator area as defined above at a frequency of one sample per 400 square feet, which equates to a 20-foot grid spacing. Grab samples will be obtained within each grid node. A maximum of four grab samples from adjacent grid nodes will be composited into one sample in the field for PCB analysis in the laboratory. This analysis will represent the respective 1,600 +/- square foot area as shown in Figure 4-1.

The grid will be conservatively applied to a two-dimensional diagram of the entire three-dimensional remediation area to maximize the total number of sample locations. The sampling points will proceed in every direction to the extent sufficient to result in a comprehensive two-dimensional grid completely overlaying the excavation area. Judgmental samples would be added as appropriate based upon field observations and as needed to adequately represent the sidewalls (where present) and floor area of each remediation area. Based on the available analytical data and related proposed limits of the remedial excavation, Drawing 4-1 (Potential Confirmatory Sample Locations) was prepared to demonstrate the expected layout of the grid with additional judgmental samples spotted as appropriate.

Evaluation of the composite data for PCBs would be based upon a direct comparison of the sample data to the 1 ppm and 25 ppm criteria. More specifically, any result for a composite sample below 1 ppm in a 1-ppm target area located beneath an engineered control and 25 ppm in a 25-ppm target area located beneath the engineered control would result in the conclusion that remediation in those areas has been completed.

PCB Confirmatory Soil Sampling – Non-Engineered Control Areas

Non-engineered control areas within the limits of the project include the wetland west of the dam, the footprint of the process water facility and ancillary structures to the process water facility, and the single area east of the eastern limits of the upper section of Willow Brook Pond (the vicinity of WT-SB-132). Post-excavation confirmatory soil/sediment grab samples for PCBs will be collected from the bottom and sidewalls of these excavated areas as shown in Drawing 4-1. The data from the individual grab samples will be evaluated pursuant to the RSR to confirm the completion of remediation in these areas.

Confirmatory Soil Sampling for Constituents Other than PCBs

As defined by the available analytical data, there are other constituents of concern that are noted in soil and sediment within the project area. These other constituents include metals, VOCs, SVOCs, TPH and cyanide. The remediation is designed to address these constituents as well as PCBs. Remediation of other constituents of concern found in the remediation areas will be completed in accordance with the RSR. In addition, an engineered control (EC) will be installed within the limits of the project area (with the exception of the wetland area which will be remediated to less than the Residential Direct Exposure Criteria for PCBs and less than the Commercial/Industrial Direct Exposure Criteria for other constituents, a small area in the vicinity of WT-SB-132, and the footprint of the process water facility which will be remediated to meet the Residential Direct Exposure Criteria for PCBs and Commercial/Industrial Direct Exposure Criteria for other constituents in soil within 4-feet of the final grade, the Commercial/Industrial Direct Exposure Criteria for PCBs for soils located in inaccessible locations and the GB Pollutant Mobility Criteria for all constituents in soils above the seasonal high water table as previously described) in accordance with the variance provision in the RSR thereby allowing soils exceeding the tabular criteria to be left in place.

As discussed earlier in this section, two specific areas of the site will need to be evaluated for PCBs as well as other constituents of concern, i.e. in the vicinity of the former oil/water separator and within the wetland area. In order to document the adequacy of the lateral extent of the remediation within the wetland area, soil grab samples will be obtained from the sidewalls of the excavations at varying depths of not less than 1-sample per 3-vertical feet every 20-feet (e.g. a 5- foot deep excavation that has a 60-foot long sidewall would have 3- sidewall samples at 2-feet below original grade and 2-sidewall samples at 4-feet below original grade at alternating depths on 10-foot centers). This sampling pattern will be enhanced with judgmental samples as needed based on field observations. This pattern would be implemented on the northern, eastern and western sidewalls of the wetland remediation area. Since the wetland area will be restored without a cap, floor sampling for constituents of concern other than PCBs will be necessary. Floor sampling will be accomplished by obtaining one grab sample at the center point of the four adjacent grid nodes defined for PCB sampling. This analysis will represent the respective 1,600 +/- square foot area as shown in Figure 4-1.

For the oil/water separator area, the excavation will proceed until the results of the previously described PCB confirmatory sampling verify removal of all soil and sediment containing greater than 25 ppm PCBs. The limits of the composite cap to be installed over this area will be defined through additional soil sampling and analysis discussed in Section 2.0. The initial sampling locations are shown on Drawing 4-1. Additional soil borings would be added, as necessary, to delineate the three-dimensional extent of soils impacted by constituents other than PCBs (i.e. metals, cyanide, VOCs, SVOCs, and TPH). It is anticipated that soils requiring remediation for constituents other than PCBs extends beyond the lateral limits of soil impacted by greater than 25 ppm PCBs. As a result, following excavation of soils greater than 25 ppm PCBs, soils from the upper three-feet outside the lateral limits of the PCB excavation, but within the limits defined as requiring remediation for other constituents pursuant to the RSRs, will be stripped and used to backfill the PCB excavation. Confirmatory sidewall grab sampling as described above will be implemented to ensure all soils requiring remediation pursuant to the RSR will be located beneath the composite cap.

The analytical data derived from these analyses for other constituents would be compared to the appropriate criteria presented in the RSR. As noted above, exceedances would be addressed by extension of the cap or further remediation, as appropriate.

Sample Collection

Procedures for collecting post-excavation PCB confirmatory soil/sediment samples are presented as follows:

- Soil/sediment will be collected from each of the discrete sampling locations through the use of a calibrated disposable syringe. One syringe will be used for each composite sample. The individual grab samples will be used to form a single composite sample in the field.
- The aliquots will be composited and mixed thoroughly in the laboratory-supplied glassware.
- At the laboratory, a final sample, of sufficient weight and volume will be collected from the composite, dried at low temperature or in a desiccator at ambient temperature, extracted and analyzed to represent the post-excavated confirmatory soil/sediment sample.
- A second portion of the sample will be weighed out at the same time as the portion to be used for analytical determination. This portion will be weighed, oven-dried and used to calculate the percent dry weight of the sample. The oven-dried aliquot will not be extracted or used for analytical determination.

Procedures for collecting vertical and lateral limit confirmatory soil samples (constituents other than PCBs) are presented as follows:

- Soil will be collected from each of the discrete sampling locations. The individual grab samples will not be used to form a composite sample.
- A sample, of sufficient weight and volume will be obtained from the sample container, extracted and analyzed to represent the post-excavated confirmatory soil present.
- Samples for VOC analysis will be collected in accordance with SW-846 Method 5035.
- A second portion of the sample will be weighed out at the same time as the portion to be used for analytical determination. This portion will be weighed, oven-dried and used to calculate the percent dry weight of the sample. The oven-dried aliquot will not be extracted or used for analytical determination.

Soil/sediment samples shall be collected using disposable sampling equipment or decontaminated spatulas, split-spoon samplers, augers or an equivalent. All disposable components of a sampling device will be disposed of prior to sample collection and all fixed components of a sampling device will be decontaminated prior to sample collection. The materials and procedures to collect post-excavation confirmatory soil/sediment samples are presented below.

- Appropriate health and safety equipment;
- Plastic sheeting;
- Tape measure (50 feet or greater);
- Appropriate soil sample containers;
- Appropriate transport containers (coolers) with ice and appropriate labeling, packing, and shipping materials;
- Field forms and labels;
- Chain-of-custody forms; and
- Site map with post-excavation confirmatory soil/sediment locations.

Each component of the sampling device will be decontaminated or replaced with a new, dedicated, or disposable component prior to collecting soil/sediment samples for laboratory analysis. The sampling equipment will be decontaminated as previously discussed.

A portion of each confirmatory soil sample will be used for visual characterization. In addition, field analysis will be conducted to determine if PCB concentrations are above or below the RA objective of 25 ppm. The field analysis will be performed using screening tests, as for example, rapid immunoassay screen test kits. The PCB field test kits are a semi-quantitative screening method that determines whether the total PCB concentration is above or below the specified threshold values by comparison with a standard. Rapid immunoassay screen tests will not be used to determine final compliance with the RA objectives, rather they will be used as a means to direct the need for further excavation prior to embarking on final confirmatory sampling and analysis at a fixed laboratory in accordance with the procedures outlined above. The manufacturer will provide standard operating procedures for PCB field test kits. Final confirmatory samples will be submitted to the laboratory for analysis for PCBs (USEPA SW-846 Method 8082A revised Jan. 1998).

QA/QC soil/sediment samples will also be collected as described in Section 4.5.2 and in the QAPP presented in Section 5.0. Trip blanks, equipment blanks, duplicate samples and performance evaluation samples will be submitted for analysis. Table 4-1 presents the number of soil/sediment samples to be collected, and Table 4-2 presents the associated QA/QC soil sampling frequencies. Samples will be placed in appropriate laboratory supplied sample containers, preserved as described in Section 4.4.1, and labeled as described in Section 4.4.2. The samples will be handled, packaged, and shipped under appropriate chain-of-custody procedures as presented in Section 4.4.3.

4.2.3 Disposal Characterization Sampling

Contaminated soil and sediment will be characterized for disposal based on the "as-found" concentration of PCBs in accordance with 40 CFR 761.61. This data will establish the basis for segregation within the staging areas. Additional analysis will be performed on stockpile grab samples as needed to satisfy the disposal vendor. Additional analytes beyond PCBs will include metals, VOCs, SVOCs, TPH, or cyanide as appropriate for thorough characterization. The waste will be disposed of based upon the more restrictive analytical data regardless of the as-found concentrations (e.g. if in-situ characterization documents < 50 ppm PCBs and the stockpile data suggests > 50 ppm, the waste disposal profile used for this particular load would be based on the stockpile data). Stockpile analytical data would not be used to reduce any disposal restrictions on the material.

A minimum of two and a maximum of four separate waste streams are expected. The minimum two waste streams are PCB remediation waste (PCBs > 50 mg/kg) and PCB contaminated waste (PCBs < 50 mg/kg). The additional two waste streams would include the above minimum two but with the addition of other underlying hazardous constituents. Supplemental analysis (for PCBs as well as other constituents of concern) will be performed for disposal vendor satisfaction and for disposal characterization of the concrete debris from demolition of the process water facility and the former oil/water separator. Supplemental analysis for disposal vendor satisfaction will be performed from stockpile grab samples using a random node sampling technique. Disposal characterization sampling of concrete debris will be performed at a rate of approximately 1 sample per 500 tons of concrete debris or at a more frequent rate as directed by the disposal vendor.

4.2.4 Miscellaneous Sampling

In addition to the sampling activities described above, additional sampling may be performed to determine handling and disposal requirements. These samples may include effluent samples from the temporary wastewater treatment system and debris from the demolition of the existing process water

facility. A description of the sampling and analysis to be conducted for each of these materials is presented below.

Effluent Samples from the Temporary Wastewater Treatment System

Surface water or groundwater that enters the active remedial excavations and water generated from soil/sediment dewatering activities will be pumped to on-site storage tanks and treated on site at a temporary wastewater treatment system. During normal operation of the temporary wastewater treatment system, effluent samples will be collected and analyzed for specific parameters as required by the discharge permit. Effluent samples will be collected and analyzed in accordance to the frequency specified by the permit to confirm that discharge permit limits are achieved.

Demolition of the Existing Water Process Facility

As part of the RA, the existing process water facility will be demolished. Further evaluation of the building system and building components will be performed to determine disposal requirements; these requirements will be reviewed in the RD.

4.3 Sample Designation System

4.3.1 Sample Codes

A six-digit designation code and sample date will provide each sample with a unique sample identification number. This alphanumeric system will apply to all samples collected and submitted to the designated laboratory for analysis. The designation codes that will be used for the samples collected, as part of the RA, are presented below:

Sample Type	Sample Location Designation
Confirmatory Soil/Sediment Samples	• A prefix indicating that the sample was collected in the Waste Treatment area (WT-) • A designation (CS) indicating that the sample is a confirmatory sample; • A consecutive number indicating the sample collected.
Disposal Characterization Soil/Sediment Sample	• A prefix indicating that the sample was collected in the Waste Treatment area (WT-) • A designation (DC-) indicating that the sample is a disposal characterization sample; • A consecutive number indicating the sample collected.
Temporary Wastewater Treatment System Effluent Samples	• A prefix indicating that the sample was collected in the Waste Treatment area (WT-) • Samples of the effluent water from the treatment system will contain a the designation (EW) followed by a consecutive sample number.

Blind sample numbers will be assigned to the samples submitted to the laboratory for QA/QC purposes. The blind sample numbers will be associated with the sample location designations only in the field forms.

4.4 Sample Handling and Documentation

4.4.1 Sample Containers and Preservation

Appropriate sample containers, preservation methods, and laboratory holding times for samples collected as part of the RA are shown in Table 4-3. The analytical laboratory will supply appropriate sample containers, sample labels, and preservatives.

An example of a sample label, custody seal, field sampling record and chain–of–custody form are included in Figures 4-2 through 4-5, respectively.

4.4.2 Packing, Handling, and Shipping Requirements

Sample custody seals and packing materials for filled sample containers will also be provided by the analytical laboratory. The filled, labeled, and sealed containers will be placed in a cooler with ice and packed to eliminate the possibility of container breakage.

All samples will be packaged by the field personnel and transported as low concentration environmental samples. The packaged samples will be shipped either by carrier or hand delivered to the laboratory within 36 hours of sample collection.

4.4.3 Documentation

Field personnel will provide documentation for all aspects of field sampling, field analysis, and sample chain-of-custody. This documentation constitutes a record, which allows reconstruction of all field events to aid in the data review and interpretation process. All documents, records, and information relating to the performance of the fieldwork will be retained in the project file.

Various forms of documentation to be maintained throughout the RA include:

- Daily Production Documentation – Daily field forms containing a record of all field sampling activities.
- Sampling Information – Detailed notes will be made concerning the sample location, physical observations, sample depths, and weather conditions.
- Chain-of-Custody – Chain-of-custody forms will provide the record of responsibility for sample collection, transport, and submittal to the laboratory. Chain-of-custody forms will be filled out at each sampling site, at a group of sampling sites, or at the end of each day of sampling by one of the field personnel designated to be responsible for sample custody.
- Field Equipment Calibration, and Maintenance Logs – To document the calibration and maintenance of field instrumentation, calibration and maintenance logs will be maintained for each piece of field equipment.

4.4.4 Electronic Database

All data including field and analytical data collected will be maintained in a site-specific electronic database. The database already contains all characterization data obtained during the Willow Brook and Willow Brook Pond investigations to date. All data entered in the database will be verified for accuracy.

4.5 Management of Sampling-Related Materials and Wastes

The handling of sampling related materials and wastes is discussed below.

4.5.1 Disposable Equipment and Debris

Disposable equipment and debris, such as health and safety equipment, plastic sheeting, sampling equipment, and other equipment and/or sampling debris not reused during the RA will be collected in plastic bags during sampling and disposed of as bulk PCB remediation waste and would be included in the soil loads in accordance with the miscellaneous H&S waste provisions permitted under a standard disposal profile.

4.5.2 Decontamination Rinsate

Decontamination rinsate (< 50 mg/kg PCB) will be containerized at a controlled, centralized location in an appropriate temporary storage container or in labeled 55-gallon drums. Upon completion of the field sampling activities, the rinsate will be treated to comply with the maximum allowable concentrations stipulated in the General Permit for the Discharge of Groundwater Remediation Wastewater prior to discharge to the sanitary sewer..

4.6 Field Quality Assurance/Quality Control

This section summarizes the Quality Assurance/Quality Control (QA/QC) requirements for sampling activities associated with the RA at the site.

4.6.1 Field Instrument Calibration and Preventative Maintenance

Field personnel will document the calibration and maintenance of all applicable field equipment in the appropriate field forms.

4.6.2 QA/QC Sample Collection

QA/QC samples will be collected at a frequency of one every 20 samples and submitted to the laboratory for analysis. The number of QA/QC field samples to be collected is provided in Table 4-2. The type of QA/QC samples to be collected during the RA includes trip blanks, equipment blanks, duplicate samples, aqueous performance evaluation (PE) samples, and matrix spike/matrix spike duplicate (MS/MSD) samples. Guidance on the collection of the QA/QC samples is presented below:

Trip Blanks

Trip blanks will be collected at a frequency of one every 20 samples or one per cooler per day to ensure that the samples are not contaminated by VOCs while in transit to the laboratory. The equipment blanks will be prepared by the laboratory and delivered along with the sample glassware. No trip blanks will be collected in sample batches that do not include analysis for VOCs.

Equipment Blanks

Equipment blanks are collected as a check that the decontamination procedure has been adequately performed and that cross-contamination of samples will not occur due to the sampling equipment. Equipment blanks will be prepared in the field by pouring laboratory supplied analyte-free water into or over decontaminated sampling equipment and then directly into the laboratory supplied sample bottles. One equipment blank will be collected for each representative type of equipment used (i.e., spoons, bowls, split-spoon sampler, etc.) for every 20 samples collected and/or at a minimum of once per week.

Duplicate Samples

Duplicate samples will be sent for laboratory analysis to evaluate the reproducibility of the sampling technique used. Duplicate samples will be collected at a frequency of one every 20 samples collected.

Performance Evaluation Samples

Performance evaluation samples will be sent for laboratory analysis to ensure that environmental data collection results in the delivery of analytical data of known and documented quality, suitable for its use. Aqueous PE samples for each suite of analytes (PCBs, metals, VOCs, SVOCs, TPH, and cyanide as applicable) will be collected at a frequency of one every 20 samples collected. The analytical results of the PE samples will be evaluated following USEPA Region I Performance Evaluation Sample Guidance – Attachment H, July 1996. The PE samples will be counted as field samples in the 20-sample SDG total.

5.0 QUALITY ASSURANCE PROJECT PLAN

Attachment No. 2

Dust Control Plan

DUST CONTROL PLAN
FOR
UNITED TECHNOLOGIES CORPORATION
PRATT & WHITNEY
WILLOW BROOK AND WILLOW BROOK POND
EAST HARTFORD, CT

May 2001
Revised July 2001

Prepared for

UNITED TECHNOLOGIES CORPORATION
PRATT & WHITNEY
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Comm. No. 88UT103

Table of Contents

Attachments

1. INTRODUCTION

This Dust Control Plan has been developed to outline the operational controls, monitoring requirements, and notification procedures to be implemented during the performance of the Willow Brook/Willow Brook Pond polychlorinated biphenyl (PCB) remediation project at the Pratt & Whitney (P&W) facility in East Hartford, Connecticut. As the project involves the excavation of wet soil and sediment, the generation of dust as a result of excavation and material handling activities is not anticipated to be a significant concern. This plan is organized to present the operational controls to be implemented during the project to minimize the generation of dust, to control the dust that is generated, to define monitoring requirements to ensure that abutting residents and P&W facility workers are not exposed to airborne particulate matter beyond applicable threshold levels, and to establish notification procedures and corrective actions to be implemented in the event applicable particulate thresholds are exceeded.

The action level for particulate matter in air (dust) established for this project is 150 $\mu g/m^3$ in air based on a time-weighted-average over a single 1-hour period.

2. OPERATIONAL CONTROLS

The following describes the proposed measures to be implemented during the construction activities associated with the remediation of Willow Brook and Willow Brook Pond. LEA-Cianci, Inc. (LCI) will implement remediation activities under the direct supervision of Loureiro Engineering Associates, Inc. (LEA)

2.1 Methods to Reduce Dust Creation

The following are the methods to be employed to minimize the potential for dust generation:

1. All vehicle transport routes will be maintained through the use of a mechanical sweeper;
2. All entrance and exit points from areas of excavation will be provided with an anti-tracking pad of crushed stone;
3. Transportation and disposal vendor vehicles leaving the site will be pressure washed to remove particulate matter;
4. All stockpiled materials awaiting offsite disposal will be staged within designated stockpile areas;
5. All stockpiled material from by-pass channel excavation will either be covered or dust suppressants (Section 2.2) will be applied;
6. Stockpile areas will be constructed with wind screens along the western, eastern and northern limits (predominant wind direction during the construction period is from the south and southwest);
7. Stockpiled material will either be covered or dust suppressants (Section 2.2) will be applied.

2.2 Methods to Control Dust

LCI will provide either or both of the following means to perform active dust control throughout the planned remediation activities. One method will be through the use of a full-time water truck to apply water on an as-needed basis to all active work areas. The second method will be through a truck-mounted mechanical broadcast spreader to apply chemical dust suppressants (calcium chloride or sodium chloride) to active work areas. The two methods may be implemented either alone or in conjunction with one another on an as needed basis to ensure the

150 $\mu g/m^3$ standard for the project is not exceeded. Active work areas include all areas being excavated or restored, all vehicle transport routes, and all staging and stockpiling areas for contaminated soil or backfill materials for the construction of the engineered controls.

3. MONITORING

Dust monitoring and wind direction monitoring will be performed on a daily basis during the following period:

- Dust and wind direction monitoring to commence upon initiation of demolition, excavation, or soil and sediment handling activities (material handling activities);
- Dust and wind direction monitoring to be discontinued upon completion of placement of all earthen materials associated with caps.

Wind direction monitoring will be performed through the use of a windsock to be strategically located within the limits of the project area (depicted as the Limits of Construction on Drawing 1-1 of the Remedial Action Work Plan). Real-time dust monitoring will be performed by affixing the particulate monitoring device at a location downwind of material handling activities at the site when: 1) precipitation has not occurred during the previous 24 hours; and 2) when work is being performed at the site. The individual responsible for performing the dust monitoring will manually record the maximum and time-weighted concentration at a frequency of not greater than once per hour during periods of material handling activities at the site.

Notification procedures and corrective actions are described in Section 4.0. The portable particulate monitor will be a direct read personal monitor and will be calibrated and maintained in accordance with the manufacturer recommended intervals. The dust monitor will be capable of monitoring particulate matter less than 10 microns in size, capable of storing individual readings for a single 24-hour period, and will be provided with a digital readout of maximum and time-weighted-average concentrations for a 1-hour period. At a minimum, the particulate monitor will be calibrated prior to each use. A daily log sheet for dust and wind monitoring is provided as Appendix A.

4. NOTIFICATION AND CORRECTIVE ACTION PROCEDURES

This section presents procedures to be implemented in the event daily monitoring indicates an exceedance of the 150 $\mu g/m^3$ time-weighted average standard for the project at any one individual location along the downwind perimeter of the project area. As a result, the procedures provided below are those that are necessary to correct the activities identified as resulting in the exceedance.

If during the hourly inspection and recording of particulate levels it is noted that the running time-weighted-average concentration of particulate matter exceeds 150 μ g/m^3 standard for the project, perform the following:

1. Remove the dust monitor from the sampling location and proceed to an upwind location and obtain a background measurement. If the working site particulate matter measurement is less than 100 $\mu g/m^3$ above the background level, return the monitor to the original monitoring location and continue with hourly readings. If the working site particulate matter measurement is greater than 100 $\mu g/m^3$ above the background level, perform the following tasks.

2. Immediately notify the onsite LCI Superintendent of the result via two-way radio or telephone;

3. Perform a visual inspection of the work area and identify the suspect activities generating dust;

4. Immediately proceed to the location of the suspected activities and inform workers to cease operations if operations are the cause of dust;

5. Immediately arrange for application of dust suppression materials as identified in Section 2.2;

6. Recommence project activities and repeat sampling at the original downwind sampling location where the exceedance was noted; and

7. Repeat steps 3 though 6, if necessary, until the particulate reading is less than the 150 $\mu g/m^3$ standard over a one-hour period.

Attachment A

Dust and Wind Monitoring
Daily Log Sheet

Willow Brook and Willow Brook Pond
PCB Remediation Project
Dust Control Corrective Action Sheet

Date: _____
Location of Exceedance: _____
Time: _____ a.m./p.m.

Description of Corrective Actions:

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Communicate "lessons learned" at following day Health and Safety meeting.

United Technologies/Pratt & Whitney
Post Remediation Maintenance and Monitoring Program
Willow Brook and Willow Brook Pond

This post-remediation maintenance program for the engineered control has been developed to ensure that the structural integrity, design permeability, and effectiveness of the engineered control will be maintained. This maintenance program describes:

- Measures to be taken to periodically inspect the engineered control;
- Measures to be taken to prevent run-on and run-off of stormwater from eroding or otherwise damaging the engineered control; and
- Measures to be taken to correct the effects of any settling, subsidence, erosion or other damaging events or conditions.

The engineered control has been designed to require a minimal amount of maintenance. The required maintenance tasks are presented below.

- Regular mowing and maintenance of the area surrounding Willow Brook and Willow Brook Pond (assumed to be 3 acres mowed 20 times per year);
- Visual inspection of the stream channel of Willow Brook to ensure the rip-rap and stone layer channel protection has not been impacted;
- Inspection, via probing at up to 20 locations, of the bottom of Willow Pond to ensure the stone layer has not been eroded;
- Inspection of the engineered control installed in the vicinity of the former oil/water separator; and
- Preparation of a report documenting the inspection and the required maintenance tasks have been completed and the completion of any repairs performed in response to findings from inspections. The annual reports will be maintained by UTC/P&W.

Semi-Annual Inspections and Corrective Actions

The engineered control and the area surrounding the engineered control will be inspected on a semi-annual basis by a representative of United Technologies Corporation/Pratt & Whitney Division in the following areas:

1. Signs of erosion

2. Signs of settling
3. Loss of vegetative cover
4. Undesirable growth
5. Signs of ponding and run on
6. Condition of fencing and gates
7. Condition of rip-rap in Willow Brook stream channel
8. Condition of stone layer in Willow Brook
9. Burrowing animals
10. Monitoring well network

The individuals performing the inspection will maintain the requisite skills to fully assess each of the 10 areas described above. The results of these inspections will be summarized in the Final Cover Inspection Form presented as Exhibit 1. If any deficiencies are noted, the appropriate corrective actions will be taken as described in the following paragraphs.

Any erosion damage to vegetated surfaces will be corrected during the growing season (April through September) by reapplying the appropriate soil layers and reseeding the damaged areas. Similarly, any damage related to settling would be repaired in the same manner. Erosion to sub aqueous caps or rip-rap along the Willow Brook stream channel would be corrected within one month of the inspection by installation of additional stone or rip-rap.

Loss of vegetative cover will be repaired by reseeding, replanting, fertilizing and watering as necessary until plant growth is re-established. Reseeding and replanting will be performed during the growing season (April through September). In addition, any undesirable plant growth that could affect the integrity of the engineered control (i.e. small trees, saplings, shrubs) would be manually removed as soon as detected, and the cover system would be repaired as described previously for erosion damage.

If any burrowing animals were found to be living in the area of the engineered control, appropriate measures would be taken to remove the animals from the site. The synthetic components of the engineered control in the vicinity of the oil water separator will also be inspected to verify that no damage has taken place. Any holes made by burrowing animals would be filled with topsoil and reseeded. Damage to the synthetic liner will be repaired by patching in accordance with the manufacturer's requirements.

Any damaged fence or gates will be repaired.

Any deficiencies found will be corrected within 4 weeks from the time of discovery or as soon as practicable if weather conditions prohibit correction within 4 weeks.

Inspections Following Significant Precipitation Events and Corrective Actions

The engineered control and the area surrounding the engineered control will be inspected on an annual basis as described above, and following the occurrence of a precipitation event resulting in greater than or equal to 2 inches of rainfall over a 24-hour period. The inspection would be performed by a representative of United Technologies Corporation/Pratt & Whitney Division in the same areas as described for the semi-annual inspection above. Documentation of the inspection and corrective actions would be in accordance with the procedures outlined above for semi-annual inspections.

Inspections During Regular Maintenance Activities

During the performance of regular maintenance activities such as mowing, or other landscaping tasks, representatives of United Technologies Corporation/Pratt & Whitney Division will be instructed to report any and all compromising conditions observed within the engineered control areas to an appropriate party. Documentation of the follow-up inspection and corrective actions implemented would be in accordance with the procedures outlined above for semi-annual inspections.

Reporting

On an annual basis, a report will be generated documenting all inspection, maintenance and corrective actions completed during the previous calendar year. The report will be completed by January 31. United Technologies Corporation/Pratt & Whitney Division will maintain the annual reports.

United Technologies/Pratt & Whitney
Post Remediation Maintenance and Monitoring Program
Willow Brook and Willow Brook Pond

Exhibit 1

Post-Remediation Maintenance Inspection Form

United Technologies/Pratt & Whitney
Post Remediation Maintenance Program
Willow Brook and Willow Brook Pond

Weather Conditions: _____ Inspector: _____
Inspection Date: _____ Reviewed By: _____
Inspection Time: _____

INSPECTION POINT	DESCRIPTION	GOOD	FAIR	POOR
1) Signs of erosion	Check for gullies of more than 2 inches in depth.			
2) Signs of settling	Look for ponding and for settling of soil of more than 3 inches over a 5 sq. foot area.			
3) Loss of vegetative cover	Check for loss of vegetation cover in any area greater than 5 square feet.			
4) Undesirable growth	Check for growth that is in excess of ½ inch in diameter (woody vegetation) and taller than 2 feet.			
5) Signs of ponding and run on	Look for areas of more than 5 square feet of standing water or areas where surface water is running onto cap.			
6) Condition of fencing and gates	Check perimeter fence to make sure it is not damaged (no holes greater than 4-inches in diameter), gates are operable, and locks are in place.			
7) Condition of rip-rap in Willow Brook stream channel	Observe entire length of stream channel. Verify that rip-rap has not been displaced.			
8) Condition of stone layer in Willow Brook	Perform probing of bottom of Willow Brook Ponds at 5 locations in upper pond and 15 locations within lower pond. Verify refusal on stone layer at all locations.			
9) Burrowing animals	Verify no holes larger than 2 inches in diameter in cap.			
10) Monitoring well network	Check concrete collar protective casing, locks, legible well identification.			
	1.Condition of lock			
	2.Visible ID of wells			
	3.Ponding or infiltration of surface water			
	4.Condition of concrete collar			
	5.Condition of steel casing			

Report all deficiencies to the designated representative of Pratt & Whitney
List all deficiencies, the corrective measures taken, and the date corrective measures were completed:

1) _____

Corrective Action: _____

2) _____

Corrective Action: _____

3) _____

Corrective Action: _____

4) _____

Corrective Action: _____

Attachment No. 4

Revised pages of the Remedial Action Work Plan,

Dust control Plan and

Post Remediation Maintenance and Monitoring Program with Revisions Highlighted.

Remedial Action Work Plan

1.0 INTRODUCTION

1.1 General

This Remedial Action Work Plan (RAWP) has been developed to present the approach and strategy for the remediation of Polychlorinated Biphenyl (PCB) contaminated sediment within Willow Brook and Willow Brook Pond at the United Technologies Corporation (UTC), Pratt & Whitney (P&W) manufacturing facility in East Hartford, Connecticut (Site). A Site Location Map is included as Figure 1-1. The remediation approach consists of the excavation and offsite disposal of soil and sediment from within and immediately surrounding Willow Brook and Willow Brook Pond that contains PCBs at concentrations greater than 25 milligram per kilogram (mg/kg or parts per million (ppm)).

Following excavation, a geotextile, soil and rock cap (engineered control) will be installed over the entirety of Willow Brook Pond and the open channel of Willow Brook from Willow Brook Pond to Main Street. The exceptions to this approach is the wetland downgradient of the dam where excavation of soil at concentrations greater than the Residential Direct Exposure Criteria for PCBs will be performed and the area backfilled and planted to restore the wetland, and the footprint of the process water facility where soil will be remediated to meet the Residential Direct Exposure Criteria for PCBs for soils within 4-feet of the final grade, the Commercial/Industrial Direct Exposure Criteria for PCBs for soils located in inaccessible locations and the GB Pollutant Mobility Criteria for soils above the seasonal high water table, prior to the placement of backfill. This particular alternative necessitates a variance to the criteria of the Remediation Standard Regulations (RSRs). In accordance with 22a-133k-2(f)(2)(A) and (B) of the Regulations of Connecticut State Agencies (RCSA), a request to use an engineered control (Request for Variance) was submitted to the Commissioner of the Connecticut Department of Environmental Protection (CTDEP) in January 2001 and was subsequently revised in response to CTDEP comments in May 2001. This report, coupled with the May 2001 revision of the January 2001 Request for Variance, have been prepared to satisfy these requirements. The Request for Variance is incorporated herein by reference.

Following remediation, the open channel of Willow Brook from the pond to Main Street will be restored to the current configuration. In response to a request by the Department of Environmental Protection (DEP) staff, the Willow Brook stream channel will be slightly modified between the dam that impounds Willow Brook Pond and Main Street to reduce the slope of the banks to control potential erosion and to modify the character of the channel bottom to create a low flow channel with pools and eddies. Willow Brook Pond will be restored to the current configuration. The proposed sediment cap will be installed throughout the pond bottoms. Due to the thickness of the cap (3-feet) and based on the proposed sediment removal volume, the final bathymetry within the ponds will be slightly modified to accommodate the proposed cap section.

The limits of the project are defined in two separate areas (upstream of the dam and downstream of the dam) and each area in two separate parts. The limits of the project area upstream of the dam is defined in two parts, Willow Brook Pond and the area of the former oil/water separator. The project area downstream of the dam is defined in two parts, the stream channel of Willow Brook Pond and the wetland area. It is recognized that the potential exists that contamination may exist outside these project limits. However, the intent of this remediation project is to address soil and sediment within and immediately surrounding Willow Brook and Willow Brook Pond. Measures to address contamination beyond those limits described below would be addressed in the future as separate projects.

Area Preparation

Prior to demolition, a complete survey of the structures and their components will be performed. The survey is necessary to determine decommissioning, demolition, and disposal requirements. UTC/P&W will be responsible for shutdown and removal of components they intend to reuse from the process water facility.

Process Water Buildings

Demolition of the process water facilities will extend to a depth necessary to achieve the project objectives of remediating PCB contaminated soil to meet the Residential Direct Exposure Criteria for soils within 4-feet of the final grade, the Commercial/Industrial Direct Exposure Criteria for soils located in inaccessible locations and the GB Pollutant Mobility Criteria for soils above the seasonal high water table. Other related structures, such as pilings, erosion structures, etc., will also be demolished and removed to a depth necessary to achieve the project objectives. Pipes and utilities connected to these buildings will be abandoned or removed during the demolition activities or during the soil and sediment removal phase of the project. Utilities designated for in-place abandonment will be will be analytically assessed and decontaminated if necessary to achieve a 1 µg/100 cm^2, 10 µg/100 cm^2, or 25 µg/100 cm^2 for abandonment if located in a 1 ppm, 10 ppm or 25 ppm remediation area, respectively. Utilities located within an area of soil remediation shall be excavated and disposed of as bulk remediation waste.

A Civil War marker/gravestone is located to the east of the main water processing building. This feature shall be protected during all aspects of the work.

Former Oil/Water Separator

A buried oil/water separator is located between the upper and lower sections of Willow Brook Pond. This structure and surrounding soils are contaminated with PCBs. The oil/water separator, its contents, and the soil containing greater than 25 ppm PCBs surrounding the structure will be completely removed and disposed of at an offsite location during the project. If a light-non-aqueous phase liquid (LNAPL) is identified during excavation, the remediation of will proceed until the LNAPL is removed in accordance with Section 22a-449(d)-106(f) of the Regulations of Connecticut State Agencies. However, it is anticipated that the presence of LNAPL is coincident with soils containing greater than 25 ppm PCBs and the removal of the LNAPL would be completed during excavation of those soils. Prior to removal of the structure, the oil/water separator will be exposed and any liquids will be removed, characterized, and disposed of at an offsite location.

Available analytical data are sufficient to delineate the three-dimensional extent of soil impacted by PCBs in the vicinity of the oil/water separator. However, the data are not adequate for the purposes of establishing the lateral limits of the composite cap to be installed in this area to address soils impacted by other constituents. As a result, prior to implementing the remediation in this area, soil borings will be advanced to a depth of 15 feet using the Geoprobe®. Soil samples will be collected from each Geoprobe®soil boring and analyzed for PCBs and constituents other than PCBs. The intent of the sampling will be to delineate the three-dimensional extent of other soils requiring remediation for other constituents pursuant to the RSRs. It is anticipated that soil samples will be analyzed for mass and SPLP metals (RCRA 8 plus copper, nickel and zinc), cyanide, VOCs, SVOCs, and TPH. The location of each soil boring is discussed in Section 4.0.

4.2.2 Post-Excavation Confirmatory Sampling

Post-excavation confirmatory sampling of soil/sediment will be conducted in the areas to be excavated (Drawing 2-3) to confirm that residual PCB concentrations do not exceed the RA objectives at the limits of the excavations (25 ppm PCBs in all areas to be capped, GB Pollutant Mobility Criteria for all soils above the seasonal high water table and the Commercial/Industrial Direct Exposure Criteria in inaccessible soil locations within and immediately adjacent to the process water buildings, and the Residential Direct Exposure Criteria in the wetland area to the north of the stream channel and within the upper 4-feet from final grade within the process water facility area). The proposed layout for the confirmatory sampling is presented on Drawing 4-1. Confirmatory soil sampling will be performed throughout the project as necessary to document the adequacy of the remedial measures as proposed.

PCB Confirmatory Soil Sampling – Engineered Control Areas

Post-excavation confirmatory soil/sediment samples for PCBs will be collected from the bottom and sidewalls of the excavated areas which will be located beneath the engineered controls within Willow Brook. Willow Brook Pond, and the oil-water separator area as defined above at a frequency of one sample per 400 square feet, which equates to a 20-foot grid spacing. Grab samples will be obtained within each grid node. A maximum of four grab samples from adjacent grid nodes will be composited into one sample in the field for PCB analysis in the laboratory. This analysis will represent the respective 1,600 +/- square foot area as shown in Figure 4-1.

The grid will be conservatively applied to a two-dimensional diagram of the entire three-dimensional remediation area to maximize the total number of sample locations. The sampling points will proceed in every direction to the extent sufficient to result in a comprehensive two-dimensional grid completely overlaying the excavation area. Judgmental samples would be added as appropriate based upon field observations and as needed to adequately represent the sidewalls (where present) and floor area of each remediation area. Based on the available analytical data and related proposed limits of the remedial excavation, Drawing 4-1 (Potential Confirmatory Sample Locations) was prepared to demonstrate the expected layout of the grid with additional judgmental samples spotted as appropriate.

Evaluation of the composite data for PCBs would be based upon a direct comparison of the sample data to the 1 ppm and 25 ppm criteria. More specifically, any result for a composite sample below 1 ppm in a 1-ppm target area located beneath an engineered control and 25 ppm in a 25-ppm target area located beneath the engineered control would result in the conclusion that remediation in those areas has been completed.

PCB Confirmatory Soil Sampling – Non-Engineered Control Areas

Non-engineered control areas within the limits of the project include the wetland west of the dam, the footprint of the process water facility and ancillary structures to the process water facility, and the single area east of the eastern limits of the upper section of Willow Brook Pond (the vicinity of WT-SB-132). Post-excavation confirmatory soil/sediment grab samples for PCBs will be collected from the bottom and sidewalls of these excavated areas as shown in Drawing 4-1. The data from the individual grab samples will be evaluated pursuant to the RSR to confirm the completion of remediation in these areas.

Confirmatory Soil Sampling for Constituents Other than PCBs

As defined by the available analytical data, there are other constituents of concern that are noted in soil and sediment within the project area. These other constituents include metals, VOCs, SVOCs, TPH and cyanide. The remediation is designed to address these constituents as well as PCBs. Remediation of other constituents of concern found in the remediation areas will be completed in accordance with the RSR. In addition, an engineered control (EC) will be installed within the limits of the project area (with the exception of the wetland area which will be remediated to less than the Residential Direct Exposure Criteria for PCBs and less than the Commercial/Industrial Direct Exposure Criteria for other constituents, a small area in the vicinity of WT-SB-132, and the footprint of the process water facility which will be remediated to meet the Residential Direct Exposure Criteria for PCBs and Commercial/Industrial Direct Exposure Criteria for other constituents in soil within 4-feet of the final grade, the Commercial/Industrial Direct Exposure Criteria for PCBs for soils located in inaccessible locations and the GB Pollutant Mobility Criteria for all constituents in soils above the seasonal high water table as previously described) in accordance with the variance provision in the RSR thereby allowing soils exceeding the tabular criteria to be left in place.

As discussed earlier in this section, two specific areas of the site will need to be evaluated for PCBs as well as other constituents of concern, i.e. in the vicinity of the former oil/water separator and within the wetland area. In order to document the adequacy of the lateral extent of the remediation within the wetland area, soil grab samples will be obtained from the sidewalls of the excavations at varying depths of not less than 1-sample per 3-vertical feet every 20-feet (e.g. a 5- foot deep excavation that has a 60-foot long sidewall would have 3- sidewall samples at 2-feet below original grade and 2-sidewall samples at 4-feet below original grade at alternating depths on 10-foot centers). This sampling pattern will be enhanced with judgmental samples as needed based on field observations. This pattern would be implemented on the northern, eastern and western sidewalls of the wetland remediation area. Since the wetland area will be restored without a cap, floor sampling for constituents of concern other than PCBs will be necessary. Floor sampling will be accomplished by obtaining one grab sample at the center point of the four adjacent grid nodes defined for PCB sampling. This analysis will represent the respective 1,600 +/- square foot area as shown in Figure 4-1.

For the oil/water separator area, the excavation will proceed until the results of the previously described PCB confirmatory sampling verify removal of all soil and sediment containing greater than 25 ppm PCBs. The limits of the composite cap to be installed over this area will be defined through additional soil sampling and analysis discussed in Section 2.0. The initial sampling locations are shown on Drawing 4-1. Additional soil borings would be added, as necessary, to delineate the three-dimensional extent of soils impacted by constituents other than PCBs (i.e. metals, cyanide, VOCs, SVOCs, and TPH). It is anticipated that soils requiring remediation for constituents other than PCBs extends beyond the lateral limits of soil impacted by greater than 25 ppm PCBs. As a result, following excavation of soils greater than 25 ppm PCBs, soils from the upper three-feet outside the lateral limits of the PCB excavation, but within the limits defined as requiring remediation for other constituents pursuant to the RSRs, will be stripped and used to backfill the PCB excavation. Confirmatory sidewall grab sampling as described above will be implemented to ensure all soils requiring remediation pursuant to the RSR will be located beneath the composite cap.

The analytical data derived from these analyses for other constituents would be compared to the appropriate criteria presented in the RSR. As noted above, exceedances would be addressed by extension of the cap or further remediation, as appropriate.

Sample Collection

Dust control Plan

3. MONITORING

Dust monitoring and wind direction monitoring will be performed on a daily basis during the following period:

- Dust and wind direction monitoring to commence upon initiation of demolition, excavation, or soil and sediment handling activities (material handling activities);
- Dust and wind direction monitoring to be discontinued upon completion of placement of all earthen materials associated with caps.

Wind direction monitoring will be performed through the use of a windsock to be strategically located within the limits of the project area (depicted as the Limits of Construction on Drawing 1-1 of the Remedial Action Work Plan). Real-time dust monitoring will be performed by affixing the particulate monitoring device at a location downwind of material handling activities at the site when: 1) precipitation has not occurred during the previous 24 hours; and 2) when work is being performed at the site. The individual responsible for performing the dust monitoring will manually record the maximum and time-weighted concentration at a frequency of not greater than once per hour during periods of material handling activities at the site.

Notification procedures and corrective actions are described in Section 4.0. The portable particulate monitor will be a direct read personal monitor and will be calibrated and maintained in accordance with the manufacturer recommended intervals. The dust monitor will be capable of monitoring particulate matter less than 10 microns in size, capable of storing individual readings for a single 24-hour period, and will be provided with a digital readout of maximum and time-weighted-average concentrations for a 1-hour period. At a minimum, the particulate monitor will be calibrated prior to each use. A daily log sheet for dust and wind monitoring is provided as Appendix A.

Post Remediation Maintenance and Monitoring Program

United Technologies/Pratt & Whitney
Post Remediation Maintenance and Monitoring Program
Willow Brook and Willow Brook Pond

This post-remediation maintenance program for the engineered control has been developed to ensure that the structural integrity, design permeability, and effectiveness of the engineered control will be maintained. This maintenance program describes:

- Measures to be taken to periodically inspect the engineered control;
- Measures to be taken to prevent run-on and run-off of stormwater from eroding or otherwise damaging the engineered control; and
- Measures to be taken to correct the effects of any settling, subsidence, erosion or other damaging events or conditions.

The engineered control has been designed to require a minimal amount of maintenance. The required maintenance tasks are presented below.

- Regular mowing and maintenance of the area surrounding Willow Brook and Willow Brook Pond (assumed to be 3 acres mowed 20 times per year);
- Visual inspection of the stream channel of Willow Brook to ensure the rip-rap and stone layer channel protection has not been impacted;
- Inspection, via probing at up to 20 locations, of the bottom of Willow Pond to ensure the stone layer has not been eroded;
- Inspection of the engineered control installed in the vicinity of the former oil/water separator; and
- Preparation of a report documenting the inspection and the required maintenance tasks have been completed and the completion of any repairs performed in response to findings from inspections. The annual reports will be maintained by UTC/P&W.

Semi-Annual Inspections and Corrective Actions

The engineered control and the area surrounding the engineered control will be inspected on a semi-annual basis by a representative of United Technologies Corporation/Pratt & Whitney Division in the following areas:

1. Signs of erosion

2. Signs of settling
3. Loss of vegetative cover
4. Undesirable growth
5. Signs of ponding and run on
6. Condition of fencing and gates
7. Condition of rip-rap in Willow Brook stream channel
8. Condition of stone layer in Willow Brook
9. Burrowing animals
10. Monitoring well network

The individuals performing the inspection will maintain the requisite skills to fully assess each of the 10 areas described above. The results of these inspections will be summarized in the Final Cover Inspection Form presented as Exhibit 1. If any deficiencies are noted, the appropriate corrective actions will be taken as described in the following paragraphs.

Any erosion damage to vegetated surfaces will be corrected during the growing season (April through September) by reapplying the appropriate soil layers and reseeding the damaged areas. Similarly, any damage related to settling would be repaired in the same manner. Erosion to sub aqueous caps or rip-rap along the Willow Brook stream channel would be corrected within one month of the inspection by installation of additional stone or rip-rap.

Loss of vegetative cover will be repaired by reseeding, replanting, fertilizing and watering as necessary until plant growth is re-established. Reseeding and replanting will be performed during the growing season (April through September). In addition, any undesirable plant growth that could affect the integrity of the engineered control (i.e. small trees, saplings, shrubs) would be manually removed as soon as detected, and the cover system would be repaired as described previously for erosion damage.

If any burrowing animals were found to be living in the area of the engineered control, appropriate measures would be taken to remove the animals from the site. The synthetic components of the engineered control in the vicinity of the oil water separator will also be inspected to verify that no damage has taken place. Any holes made by burrowing animals would be filled with topsoil and reseeded. Damage to the synthetic liner will be repaired by patching in accordance with the manufacturer's requirements.

Any damaged fence or gates will be repaired.

Any deficiencies found will be corrected within 4 weeks from the time of discovery or as soon as practicable if weather conditions prohibit correction within 4 weeks.

Inspections Following Significant Precipitation Events and Corrective Actions

The engineered control and the area surrounding the engineered control will be inspected on an annual basis as described above, and following the occurrence of a precipitation event resulting in greater than or equal to 2 inches of rainfall over a 24-hour period. The inspection would be performed by a representative of United Technologies Corporation/Pratt & Whitney Division in the same areas as described for the semi-annual inspection above. Documentation of the inspection and corrective actions would be in accordance with the procedures outlined above for semi-annual inspections.

Inspections During Regular Maintenance Activities

During the performance of regular maintenance activities such as mowing, or other landscaping tasks, representatives of United Technologies Corporation/Pratt & Whitney Division will be instructed to report any and all compromising conditions observed within the engineered control areas to an appropriate party. Documentation of the follow-up inspection and corrective actions implemented would be in accordance with the procedures outlined above for semi-annual inspections.

Reporting

On an annual basis, a report will be generated documenting all inspection, maintenance and corrective actions completed during the previous calendar year. The report will be completed by January 31. United Technologies Corporation/Pratt & Whitney Division will maintain the annual reports.

Exhibit 1

Post-Remediation Maintenance Inspection Form

United Technologies/Pratt & Whitney
Post Remediation Maintenance Program
Willow Brook and Willow Brook Pond

Weather Conditions: _____ Inspector: _____
Inspection Date: _____ Reviewed By: _____
Inspection Time: _____

INSPECTION POINT	DESCRIPTION	GOOD	FAIR	POOR
1) Signs of erosion	Check for gullies of more than 2 inches in depth.			
2) Signs of settling	Look for ponding and for settling of soil of more than 3 inches over a 5 sq. foot area.			
3) Loss of vegetative cover	Check for loss of vegetation cover in any area greater than 5 square feet.			
4) Undesirable growth	Check for growth that is in excess of ½ inch in diameter (woody vegetation) and taller than 2 feet.			
5) Signs of ponding and run on	Look for areas of more than 5 square feet of standing water or areas where surface water is running onto cap.			
6) Condition of fencing and gates	Check perimeter fence to make sure it is not damaged (no holes greater than 4-inches in diameter), gates are operable, and locks are in place.			
7) Condition of rip-rap in Willow Brook stream channel	Observe entire length of stream channel. Verify that rip-rap has not been displaced.			
8) Condition of stone layer in Willow Brook	Perform probing of bottom of Willow Brook Ponds at 5 locations in upper pond and 15 locations within lower pond. Verify refusal on stone layer at all locations.			
9) Burrowing animals	Verify no holes larger than 2 inches in diameter in cap.			
10) Monitoring well network	Check concrete collar protective casing, locks, legible well identification.			
	1.Condition of lock			
	2.Visible ID of wells			
	3.Ponding or infiltration of surface water			
	4.Condition of concrete collar			
	5.Condition of steel casing			

Report all deficiencies to the designated representative of Pratt & Whitney
List all deficiencies, the corrective measures taken, and the date corrective measures were completed:

1) _____

Corrective Action: _____

2) _____

Corrective Action: _____

3) _____

Corrective Action: _____

4) _____

Corrective Action: _____